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BUREAU OF PUBLIC ROADS

VOL. 18, NO. 7 SEPTEMBER 1937


CARS PASSING ON A NARROW ROAD

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# PUBLIC ROADS ▸▸▸ *A Journal of Highway Research*

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# A STUDY OF THE PASSING OF VEHICLES ON HIGHWAYS

By J. T. Thompson, Highway Research Specialist,[1] and Norman Hebden, United States Bureau of Public Roads

THE question of what constitutes suitable or necessary road widths is one of first importance to highway engineers, economists, and administrators. Surface width greatly affects such matters as traffic capacity, highway cost, and safety. In a remarkably short time we have seen widths increase from a scant dozen feet to 20 feet or more for the undivided two-lane pavement and beyond that to multiple-lane arrangements. It is obvious that this increase is the result of the changing character of traffic, but the particular element or elements causing the change—size, speed, or traffic density—has not been determined.

The store of information bearing upon this question is scant—out of proportion to its importance. Various attempts have been made to establish facts, but the investigators have not supplied much of the information needed today in considering the relation of vehicular dimensions and speeds to road widths.

In earlier studies fixed stations were set up on the road at which observers noted the distance from the road edge of vehicles passing the station.[2] Deductions as to the probable transverse positions of vehicles in the most critical state, that is, when passing one another, were accordingly based upon observations involving only one vehicle. It was only by coincidence that simultaneous records of two passing vehicles could be obtained. One exception should be made to this general remark; in the Cleveland study, some data were obtained for passenger cars passing the station simultaneously while traveling in opposite directions.

### MOTION PICTURES TAKEN OF PASSING VEHICLES

In the early summer of 1933 the Bureau of Public Roads of the United States Department of Agriculture in cooperation with the Johns Hopkins University, the Commissioner of Motor Vehicles of Maryland, and the State Roads Commission of Maryland,[3] undertook to study this question using a radically different method. It was decided to trail and take motion pictures of vehicles in the act of passing.

The apparatus used in the investigation was simple and needs but little explanation. A motion-picture camera was mounted upon a bracket just outside the driver's window of an automobile as shown in figure 1. This camera was a spring-operated, 35-millimeter machine carrying 100 feet of film at a loading. Exposures were made with a lens having a focal length of 4 inches at the constant rate of 1 foot, or 16 frames, per second. A ratchet-and-pawl arrangement permitted the operator quickly to rewind the camera spring while driving. No serious difficulty was experienced in taking clear pictures.

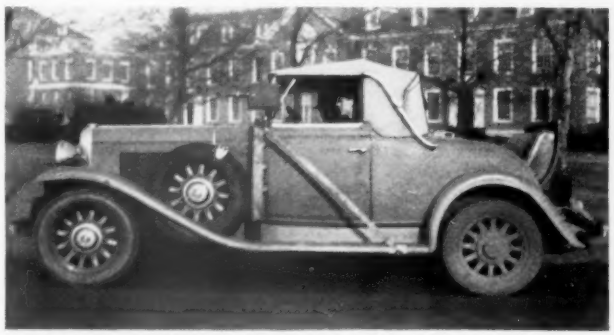

FIGURE 1.—MOTION-PICTURE CAMERA MOUNTED ON AUTOMOBILE USED IN STUDY.

After development, a positive print of the negative was studied in the office by running it through a desk-type, variable-speed machine equipped with a magnifying lens through which the film could be observed as it passed over a translucent plate behind which was a strong light. The frames showing the two vehicles opposite one another in the act of passing were thus identified and marked. (See figs. 2, 3, and 4.) Later, these marked frames were projected upon a screen as still pictures and transverse placement dimensions were scaled off.

It will be helpful to define certain terms that are frequently used in this report.

*Critical vehicle*—The vehicle being trailed by the observer's car and being passed by another vehicle.

*Passing vehicle*—The vehicle that passes the critical vehicle.

*Lateral position*—The transverse position on the road of the vehicles in question when directly opposite one another in the act of passing.

*Critical frame*—The frame on the film that shows the vehicles at the instant they are opposite each other in the act of passing. This frame is projected to get the required measurements.

*Dimension* A—The distance from the right edge of the road to the centerline of the right rear wheel of the critical vehicle.

*Dimension* B—The clearance between the passing and critical vehicles at the instant when their rear wheels are opposite during the act of passing.

*Dimension* C—The distance from the left edge of the road to the centerline of the outer wheel of the passing vehicle.

*Dimension* D—The distance center to center of the outer wheels of the passing and critical vehicles.

[1] Also Professor of Civil Engineering, The Johns Hopkins University.

[2] Transverse Distribution of Motor Vehicle Traffic on Paved Highways, by J. T. Pauls, Public Roads, vol. 6, no. 1, March 1925. Report of a Plan of Highway Improvement in the Regional Area of Cleveland, Ohio, by the Bureau of Public Roads, 1928.

[3] Besides those already mentioned, other cooperating agencies during 1934 were the Pennsylvania Department of Highways, the Department of Revenue of Pennsylvania, the Commissioner of Motor Vehicles of New Jersey, and the Board of Chosen Freeholders of Union County, N. J.

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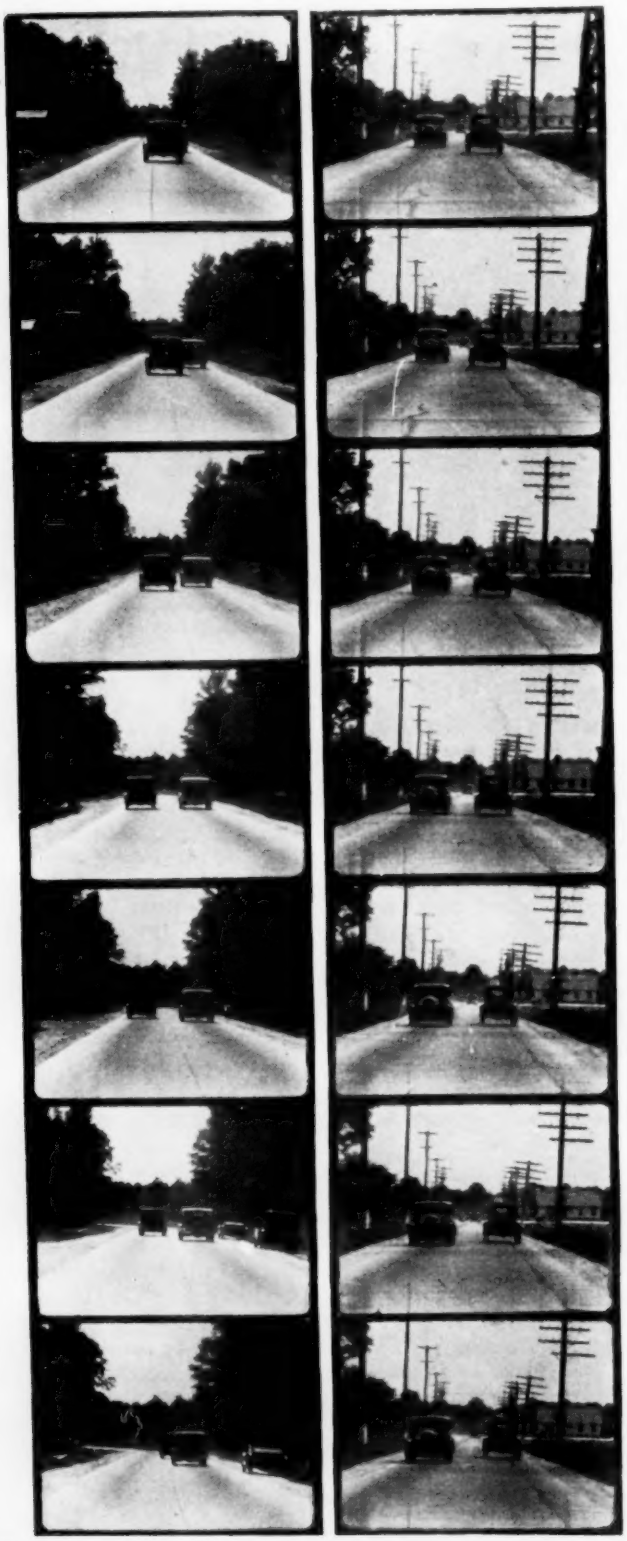

FIGURE 2.—STAGES IN TYPICAL PASSING OPERATIONS. LEFT, PASSENGER CAR PASSING PASSENGER CAR IN THE SAME DIRECTION ON A 20-FOOT ROAD; RIGHT, PASSENGER CAR PASSING PASSENGER CAR IN OPPOSITE DIRECTION ON AN 18-FOOT ROAD.

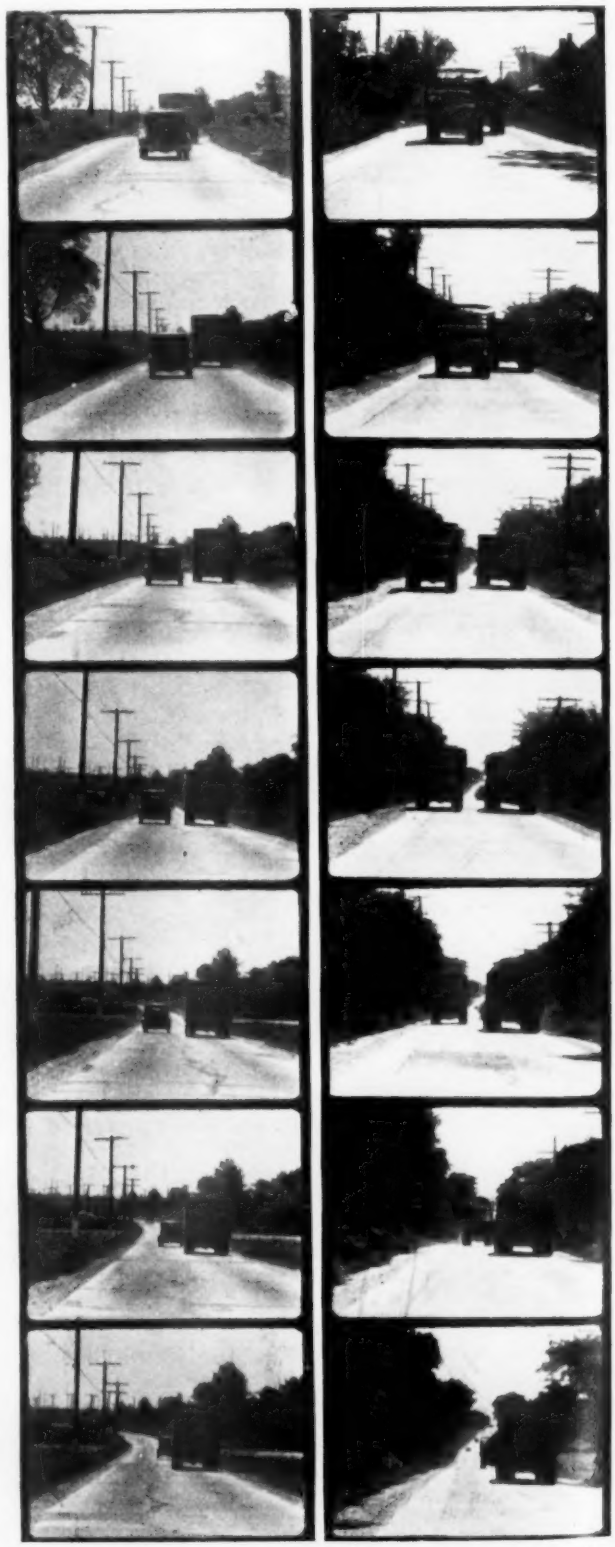

FIGURE 3.—STAGES IN TYPICAL PASSING OPERATIONS. LEFT, PASSENGER CAR PASSING TRUCK IN THE SAME DIRECTION ON AN 18-FOOT ROAD; RIGHT, TRUCK PASSING TRUCK IN THE SAME DIRECTION ON AN 18-FOOT ROAD.

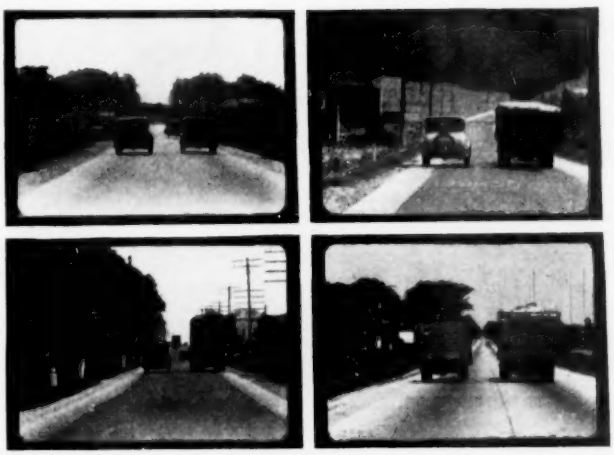

FIGURE 4.—CRITICAL FRAMES OF PASSING OPERATIONS ON 20-FOOT ROADS.

*Dimension* A+D—The "used space" of road, that is, the distance from the right edge of the road to the centerline of the outer wheel of the passing vehicle.

*Dimension* $E_c$—The distance from the right edge of the road to the centerline of the critical vehicle.

*Dimension* $E_p$—The distance from the left edge of the road to the centerline of the passing vehicle.

*Offset*—Distance between centerline of traffic lane and center of vehicle, negative when measured from the lane center toward the road edge, positive when otherwise.

The dimensions defined above apply to vehicles passing while traveling in the same or opposite directions and with the exception of offsets, $E_c$, and $E_p$ are shown diagrammatically in figure 5.

#### DISTANCES SCALED FROM ENLARGED PICTURES

Table 1 shows a sample of the data recorded in the field and information derived in the office. The field procedure was as follows: The observers placed their car in free traffic and selected a vehicle for observation and followed 200 to 300 feet behind it—near enough to get a useful picture but sufficiently far away to encourage a third vehicle to pull in between. Just as the middle vehicle pulled out to go around the leading one, the camera was started by the driver-observer and a picture of the entire passing maneuver was taken. The observers' car was kept as nearly as possible at the speed of the critical vehicle.

Tests were made in advance of the field work to determine how accurately the trailing speed would represent the speed of the vehicle trailed and it was found that the greatest error over a wide range of speeds did not exceed 5 miles per hour. The speedometer reading was recorded by a second observer who also noted, from stakes set at one-tenth mile intervals, the approximate point of passing. This observation led to a close identification of the point and subsequently notes were made regarding the dimensions of the road, the characteristics of its surface, the shoulders, and wayside conditions.

When the critical vehicle was a truck, it was stopped after the pictures were taken, and its over-all length, width, and distance center to center of tire mountings were measured. No attempt was made to stop the passing vehicle. When the critical vehicle was a passenger car, it was not stopped for measurement because it was felt that for all practical purposes such dimensions could be considered constant.

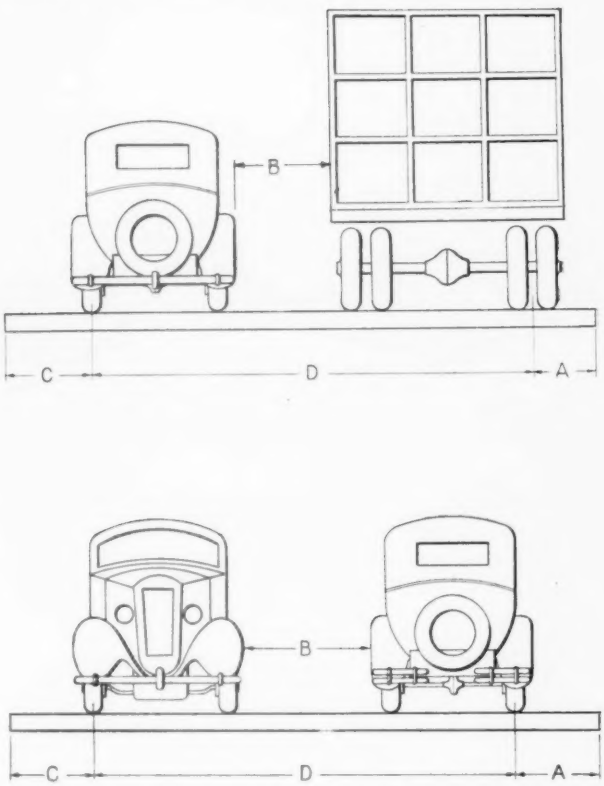


FIGURE 5.—DIMENSIONS USED IN DISCUSSING VEHICLES, PASSING IN SAME AND OPPOSITE DIRECTIONS.

In obtaining data on vehicles passing from opposite directions, only sufficient film was exposed to determine the lateral positions of the vehicles at the instant of passing. A record of the speed of the critical vehicle and the point of passage was also made.

Positive prints of film were run through a machine designed for use in film editing for the purpose of correlating film "shots" and field notes and selecting the critical frames. At this time decision was made regarding the usefulness of the picture and all observations where the positions were affected by special conditions, such as vehicles parked upon the shoulder or people walking along the side of the road, were eliminated from further consideration.

After the acceptable critical frames had been selected, they were projected upon a screen and the desired dimensions scaled off. Wherever possible, use was made of the known width of the road to establish the scale of the other dimensions. These scaled values were recorded and converted into actual position dimensions as shown in the samples in table 1.

Considerable thought was given the matter of accuracy and tolerance in scaling the dimensions. To insure the best possible accuracy and to act as a check, two different observers made measurements of the clearance, B, on every critical frame. This check and a comparison of A+C+D against the road width as measured in the field, was made in every case to insure accuracy. The tolerances adopted allowed a variation of 0.3 foot in the measurements of clearance, B, and also between the sum of A+C+D and the measured road width. These tolerances amounted to approxi-

TABLE 1.—*Samples of field data and data derived in office*

SAMPLE OF FIELD DATA, LEFT PAGE OF NOTEBOOK

Location: Philadelphia Road Date: July 25, 1933 Party {N. H. W. M.

| Serial no. | Weather | Aperture of camera | Passing vehicle: Type | Direction | Approximate station, tenths of miles (maintenance stakes) | Speed miles per hour | Critical vehicle: License no. | Type | Length | Width | Center to center of mountings |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | *Feet* | *Feet* | *Feet* |
| S-145 | Bright | 15 | Passenger | N | 35¾ S / 36¾ N | 20 | Md. 764-T | 4 WDT and 2 WDSTr | 45.9 | 8.0 | 5.95 |
| O-17 | do | 15 | do | N | 51¼ | 40 | do | do | 45.9 | 8.0 | 5.95 |
| S-146 | Hazy | 13 | do | S | 17½ N / 15¾ S | 35 | | Passenger | | | |

SAMPLE OF FIELD DATA, RIGHT PAGE OF NOTEBOOK

| Serial no. | Point of passing | Road: Type | Over all width | Condition of surface | Paved shoulder: Width | Paved shoulder: Condition | Dirt shoulder: Width | Dirt shoulder: Condition | Remarks on wayside conditions |
|---|---|---|---|---|---|---|---|---|---|
| | | | *Feet* | | *Feet* | | *Feet* | | |
| S-145 | 36+205 | Concrete 15.0 | 18.0 | Rough, patched | R. N. 3 concrete | Fair | R. N. 3 | Bad | Deep ditch at 5 feet from road edge. |
| | | | | | | | L. N. 5 | Fair | Deep ditch at 5 feet. |
| O-17 | 51+117 | do | 18.0 | Fair | do | do | R. N. 3 | Poor | Ditch at 3 feet. |
| | | | | | | | L. N. 4 | do | Ditch at 6 feet, bad edge. |
| S-146 | 16+325 | Sheet asphalt | 20.0 | Smooth | 2 each 3 feet concrete | Good | R. S. 6 | Bad | Ditch at 7 feet. |
| | | | | | | | L. S. 4 | Fair | Mail boxes at 4 to 5 feet. |

SAMPLE OF OFFICE DATA

Date: July 3, 1933 Computer: J. J.

| Serial no. | Reference | Reference: Actual width | Reference: Projected width | Width of critical vehicle: Projection | Width of critical vehicle: Actual | Width of passing vehicle: Projection | Width of passing vehicle: Actual | Projected distances: A | B | C | D | Actual distances: A | B | C | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *Feet* | *Inches* | *Inches* | *Feet* | *Inches* | *Feet* | *Inches* | *Inches* | *Inches* | *Inches* | *Feet* | *Feet* | *Feet* | *Feet* |
| S-294 | Over-all road width | 20.0 | 9.9 | 2.9 | 5.8 | 2.9 | 5.8 | 1.4 | 2.0 | 1.3 | 7.2 | 2.8 | 4.0 | 2.6 | 14.5 |
| O-337 | do | 22.0 | 10.7 | 2.9 | 6.0 | 2.8 | 5.9 | .7 | 3.6 | 1.4 | 8.6 | 1.3 | 7.3 | 2.9 | 17.8 |
| S-308 | do | 18.0 | 13.9 | 4.6 | 5.9 | 4.5 | 5.8 | 1.2 | 3.2 | 1.3 | 11.4 | 1.6 | 4.1 | 1.7 | 14.7 |

mately 5 percent for the clearance and 2 percent for the sum of A+C+D. A larger tolerance was allowed in the measurement of the clearance because this dimension was the most difficult to scale because of the indistinct outline of the vehicles in the projection when inspected at close range.

### PASSING A VEHICLE GOING IN SAME DIRECTION MAKES GREATEST DEMAND FOR ROAD WIDTH

The data obtained are sufficient to indicate the habits of drivers in passing other vehicles going in the same direction and in opposite directions on roadways of widths ranging from insufficient to ample. Widths of 18, 20, and 22 feet, were thought to give such a range. All pictures were taken on undivided, primary highways carrying recreational and commercial traffic. In general, the passing of vehicles was recorded on roads without paved shoulders but some studies were made on roads widened by shoulder paving. Table 2 gives the type, width, and shoulder conditions, on each of the roads where studies were made.

A few of the roads on which observations were made had center stripes painted on the surface to mark the lanes. Most of the concrete roads on which observations were made had longitudinal center joints that also served to mark the common boundary of the two lanes at the center of the road. No effect of the presence of a center stripe upon the position taken by either the critical or the passing vehicle during passing operations was observed.

TABLE 2.—*Description of roads on which observations were made*

| Width (feet) | Route no. and location | Year of observation | Description | Dirt shoulder |
|---|---|---|---|---|
| 18 | U S 40, vicinity of Aberdeen, Md. | 1933–34 | Concrete | Poor, 1 to 3 feet wide. |
| 18 | U S 111, Maryland line to York, Pa. | 1934 | do | Do. |
| 18 | U S 22, vicinity of Allentown, Pa. | 1934 | do | Do. |
| 18 | U S 40, Baltimore to Aberdeen, Md. | 1933 | 15-foot concrete road, widened with a 3-foot concrete strip on 1 side. | Poor, 1 to 4 feet wide. |
| 20 | U S 40, vicinity of Baltimore, Md. | 1933 | Bituminous concrete with a 3-foot concrete strip on each side | In built-up section, very narrow. |
| 20 | U S 40, vicinity of Aberdeen, Md. | 1933–34 | Concrete | Fair, 5 to 8 feet wide. |
| 20 | U S 22, vicinity of Allentown, Pa. | 1934 | do | Poor, 3 to 6 feet wide. |
| 22 | U S 40, vicinity of Baltimore, Md. | 1933 | 16-foot asphalt with a 3-foot concrete strip on each side. | Poor, 2 to 4 feet wide. |
| 22 | U S 111, vicinity of Baltimore, Md. | 1933 | 16-foot bituminous concrete with a 3-foot concrete strip on each side. | Fair, 4 to 8 feet wide. |
| 22 | Westfield Ave., vicinity of Rahway, N. J. | 1934 | Concrete | Excellent, 12 feet wide. |

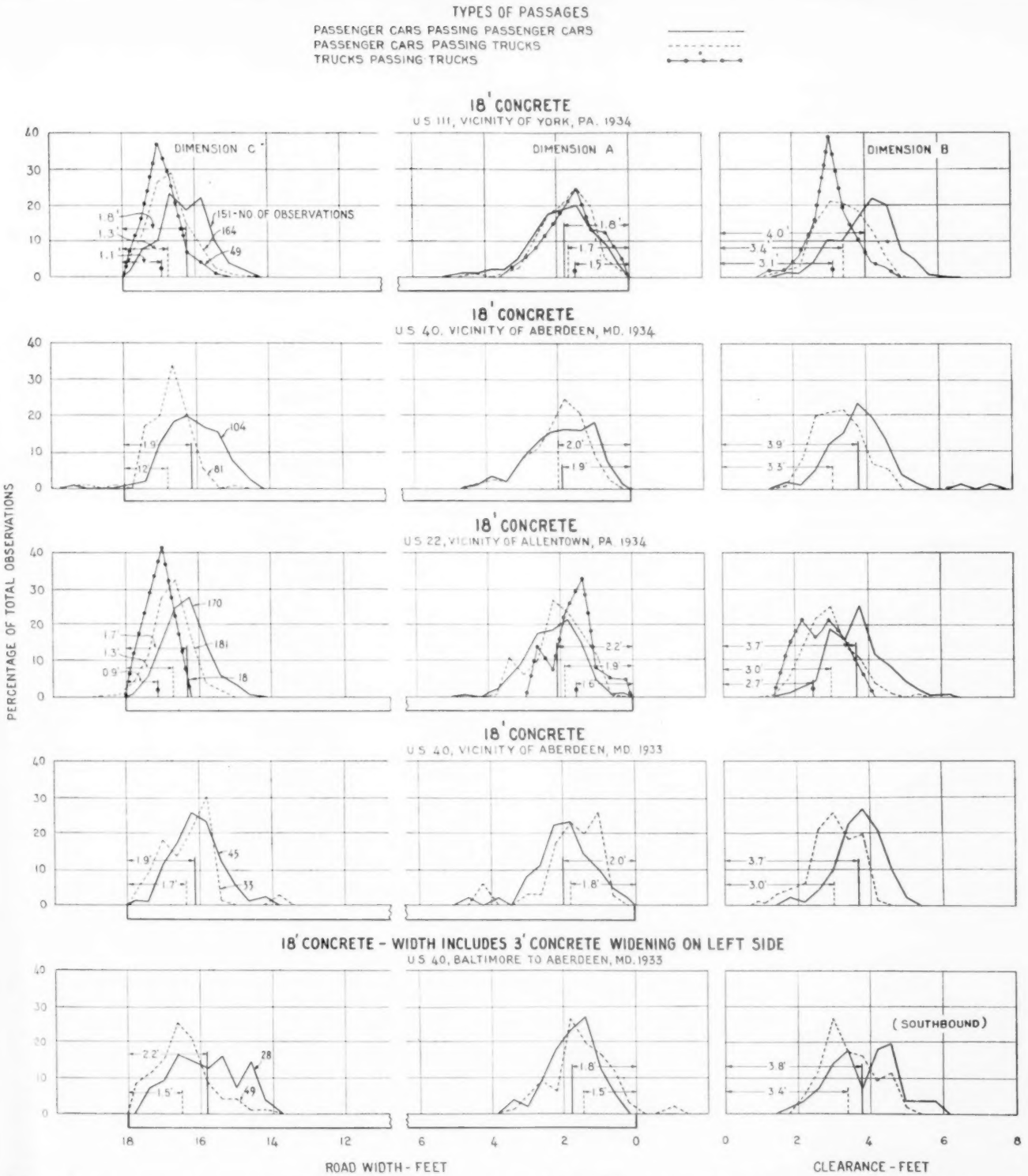


FIGURE 6.—FREQUENCY DISTRIBUTION OF DIMENSIONS A, B, AND C (SEE FIG. 5) FOR SAME-DIRECTION PASSING. NUMBER OF OBSERVATIONS IN EACH SAMPLE INDICATED BY NUMBER AGAINST FREQUENCY DISTRIBUTION LINE.

Overtaking and passing a vehicle going in the same direction is a more difficult operation and imposes a greater demand for road width than meeting and passing a vehicle. In meeting an oncoming vehicle a driver selects a position within the right lane and makes sure that the oncoming vehicle does not tend to infringe upon his lane. Experience has taught that this is the best method to avoid sideswiping. Speed can be regulated according to local conditions. As will be pointed out later, passenger cars do not run off the pavement when passing other passenger cars as is sometimes the case in same-direction passing. In same-direction passing the driver must use that portion of the roadway left to him by the vehicle ahead, dividing his attention

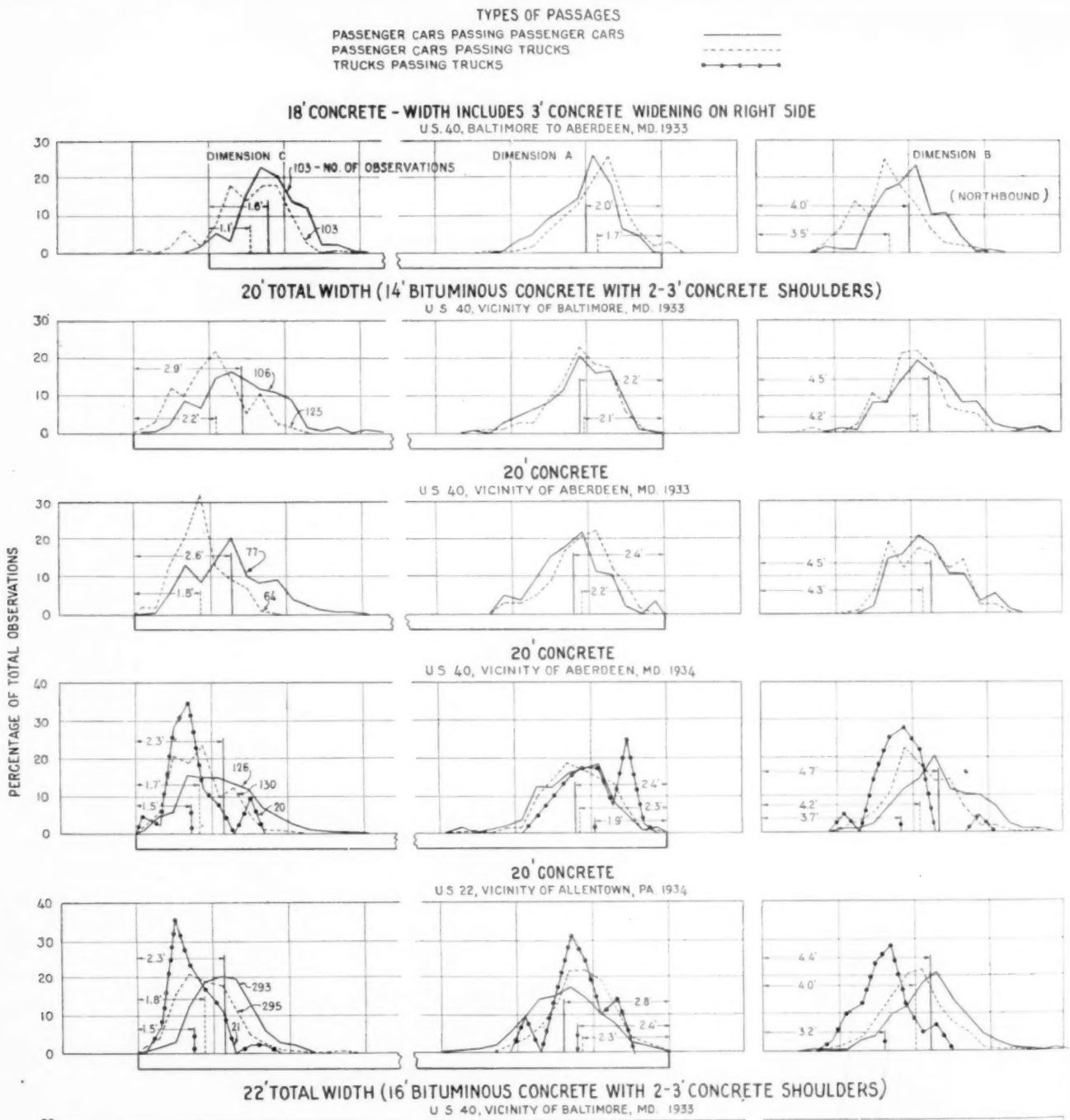


FIGURE 7.—FREQUENCY DISTRIBUTION OF DIMENSIONS A, B, AND C (SEE FIG. 5) FOR SAME-DIRECTION PASSING. NUMBER OF OBSERVATIONS IN EACH SAMPLE INDICATED BY NUMBER AGAINST FREQUENCY DISTRIBUTION LINE.

between clearance with the vehicle on the right and the road edge on the left, and must travel at a speed greater than that of the vehicle being passed.

Figures 6, 7, and 8 show, for same-direction passing, the frequency distribution of edge distance of the vehicles being passed (dimension A), the edge distance

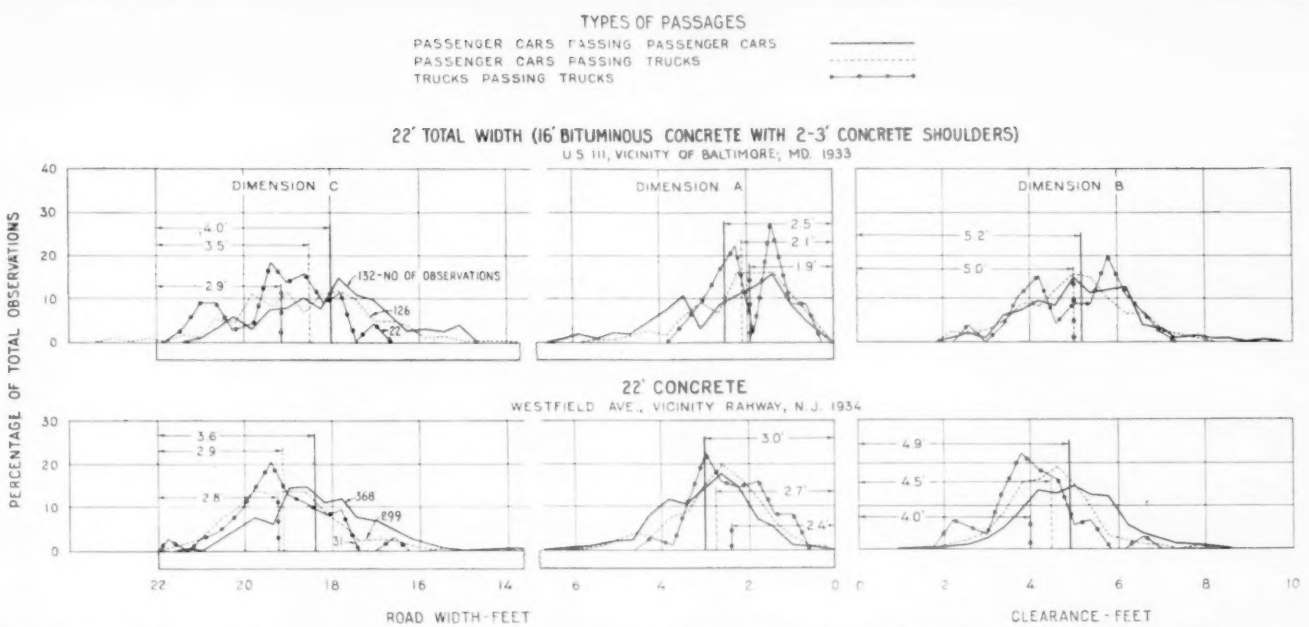


FIGURE 8.—FREQUENCY DISTRIBUTION OF DIMENSIONS A, B, AND C (SEE FIG. 5) FOR SAME-DIRECTION PASSING. NUMBER OF OBSERVATIONS IN EACH SAMPLE INDICATED BY NUMBER AGAINST FREQUENCY DISTRIBUTION LINE.

of the passing vehicles (dimension C), and the clearance between vehicles (dimension B), for each of the roads where studies were made. Passenger cars passing passenger cars are reported separately from passenger cars passing trucks.

In some instances data for trucks passing trucks are shown. Special effort was made to record trucks passing trucks but the number of observations was small, amounting to less than 6 percent of the overtaking passages recorded. This small percentage probably is the result of the relatively small proportion of trucks to total traffic and possibly to the absence of pronounced differences in speed among trucks.

Examination of figures 6 to 8 shows only slight differences in the average positions of vehicles on roads of the same width. For the 18-foot surfaces the frequency distribution lines for dimensions A, B, and C are approximately triangles with narrow bases and high altitudes. With increase in surface width to 20 feet the peaks are somewhat flattened and the bases spread out and this effect is very much more pronounced for 22-foot surfaces. This change in shape of the diagrams is an indication of relief from road-cramping.

Average dimensions from the diagrams for same-direction passing and also those for opposite-direction passing to be presented later, are given in table 3. There is surprisingly little variation in the average dimensions for surfaces of the same width, seldom more than one-half foot. This is about the width of a passenger-car tire and gives confidence as to the adequacy of the methods used.

Table 4 shows the average dimensions consolidated for each width of road but excludes bituminous roads with concrete shoulders and one concrete road widened with a 3-foot strip of concrete. This was done to eliminate the possible influence of paved shoulders on vehicle position. The table is based entirely on observations on 18-, 20-, and 22-foot concrete pavements without special shoulder construction and all conclusions as to vehicle positioning are based upon these consolidated data.

### DRIVER PSYCHOLOGY AND RELATION OF ROAD WIDTH TO VEHICLE POSITION INDICATED BY DATA

Table 4 throws light upon several moot questions. For example it has been thought that, perhaps because truck drivers have greater experience and are aware that their vehicles are generally of such width as to cause inconvenience to others, they keep closer to the right edge of the road than do passenger-car operators. Obviously this is not the case as both passenger cars and trucks apparently tend to center themselves closely on the centerline of their own traffic lane and maintain that position when being overtaken and passed. This seems to be true indiscriminately for all three of the road widths studied as the dimensions $E_c$ and the corresponding offsets of critical vehicles show.

One also wonders what drivers want or try to do, either consciously or subconsciously, when they overtake and pass other vehicles. Do they follow the centerline of their own traffic lane if they can? Are they equally concerned with the danger of sideswiping the vehicle they are passing and the hazard of running off onto the left shoulder, and as a result do they bisect the clear space between the vehicle and the road edge?

The answer to the first question is not entirely clear from the data of table 4. In contrast to the positioning of the critical vehicle whose average offset is never greater than 0.2 foot and which is alternately plus and minus, the passing vehicle is consistently to the left of its lane center, except when the relatively small passenger cars are alone involved on the relatively wide 22-foot pavement. In this case the passing vehicles could obviously follow the lane center if they wanted to but instead they apparently are satisfied with a clearance of about 5.0 feet and move well inside the lane centerline.

The answer to the second question seems to be that they are more afraid of sideswiping, since in every case they pass well to the left of the midpoint between critical vehicle and left road edge. This is brought out strikingly by figure 9 which shows diagramatically the positions of the critical and passing vehicles with respect

TABLE 3.—*Average dimensions on individual roads for various types of passages; vehicles moving in either the same or opposite direction*

18-FOOT SURFACES

| Road width, feet | Description | Year of observation | Same-direction passing: Passenger cars passing passenger cars: Number of observations | C | $E_p$ | B | A | $E_c$ | Used space | Same-direction passing: Passenger cars passing trucks: Number of observations | C | $E_p$ | B | A | $E_c$ | Used space | Same-direction passing: Trucks passing trucks: Number of observations | C | $E_p$ | B | A | $E_c$ | Used space | Opposite-direction passing: Passenger cars passing passenger cars: Number of observations | A or C | $E_c$ or $E_p$ | Number of observations | B | Opposite-direction passing: Trucks passing trucks: Number of observations | A or C | $E_c$ or $E_p$ | Number of observations | B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Ft.* | *Ft.* | *Ft.* | *Ft.* | *Ft.* | *Ft.* | | *Ft.* | *Ft.* | *Ft.* | *Ft.* | *Ft.* | *Ft.* | | *Ft.* | *Ft.* | *Ft.* | *Ft.* | *Ft.* | *Ft.* | | *Ft.* | *Ft.* | *Ft.* | | *Ft.* | | *Ft.* | *Ft.* | | *Ft.* |
| 18 | U S 40, Baltimore-Aberdeen, Md., north-bound, concrete with 3-foot concrete strip on east side | 1933 | 103 | 1.6 | 4.0 | 4.0 | 2.0 | 4.4 | 16.4 | 103 | 1.1 | 3.2 | 3.5 | 1.7 | 4.5 | 17.0 | | | | | | | | 74 | 1.9 | 4.2 | 37 | 3.9 | 38 | 0.9 | 3.7 | 19 | 3.0 |
| 18 | U S 40, Baltimore-Aberdeen, Md., south-bound, concrete with 3-foot concrete strip on east side | 1933 | 28 | 2.2 | 4.5 | 3.8 | 1.8 | 4.1 | 15.9 | 49 | 1.5 | 3.6 | 3.4 | 1.5 | 4.3 | 16.6 | | | | | | | | | | | | | | | | | |
| 18 | U S 40, vicinity Aberdeen, Md., concrete | 1933 | 45 | 1.9 | 4.3 | 3.7 | 2.0 | 4.4 | 16.2 | 33 | 1.7 | 4.0 | 3.0 | 1.8 | 4.5 | 16.4 | | | | | | | | 20 | 1.8 | 4.2 | 10 | 3.8 | | | | | |
| 18 | do | 1934 | 104 | 1.9 | 4.2 | 3.9 | 1.9 | 4.2 | 16.1 | 81 | 1.2 | 3.3 | 3.3 | 2.0 | 4.7 | 16.8 | | | | | | | | 294 | 1.8 | 4.1 | 147 | 4.1 | 128 | 1.1 | 4.0 | 64 | 2.8 |
| 18 | U S 111, Maryland line to York, Pa., concrete | 1934 | 151 | 1.8 | 4.1 | 4.0 | 1.8 | 4.2 | 16.3 | 164 | 1.3 | 3.5 | 3.4 | 1.7 | 4.4 | 16.7 | 49 | 1.1 | 3.5 | 3.1 | 1.5 | 4.2 | 16.9 | 398 | 1.8 | 4.1 | 199 | 4.1 | 404 | 1.1 | 3.9 | 202 | 3.1 |
| 18 | U S 22, vicinity Allentown, Pa., concrete | 1934 | 170 | 1.7 | 4.0 | 3.7 | 2.2 | 4.5 | 16.3 | 181 | 1.3 | 3.5 | 3.0 | 1.9 | 4.8 | 16.7 | 18 | .9 | 3.3 | 2.7 | 1.6 | 4.5 | 17.1 | 110 | 2.0 | 4.4 | 55 | 3.5 | 138 | 1.2 | 4.0 | 69 | 2.6 |

20-FOOT SURFACES

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | U S 40, vicinity Baltimore, Md., bituminous concrete with 3-foot concrete strip on each side | 1933 | 106 | 2.9 | 5.2 | 4.5 | 2.2 | 4.6 | 17.1 | 125 | 2.2 | 4.2 | 4.2 | 2.1 | 4.9 | 17.9 | | | | | | | | 54 | 2.5 | 4.8 | 27 | 4.8 | 58 | 1.6 | 4.3 | 29 | 4.4 |
| 20 | U S 40, vicinity Aberdeen, Md., concrete | 1933 | 77 | 2.6 | 5.0 | 4.5 | 2.4 | 4.8 | 17.4 | 64 | 1.8 | 4.0 | 4.3 | 2.2 | 4.9 | 18.2 | | | | | | | | 452 | 2.2 | 4.6 | 226 | 5.1 | 172 | 1.6 | 4.5 | 86 | 3.7 |
| 20 | do | 1934 | 126 | 2.3 | 4.6 | 4.7 | 2.4 | 4.8 | 17.7 | 130 | 1.7 | 3.9 | 4.2 | 2.3 | 5.1 | 18.3 | 20 | 1.5 | 4.0 | 3.7 | 1.9 | 4.7 | 18.5 | | | | | | | | | | |
| 20 | U S 22, vicinity Allentown, Pa., concrete | 1934 | 293 | 2.3 | 4.7 | 4.4 | 2.8 | 5.2 | 17.7 | 295 | 1.8 | 4.1 | 4.0 | 2.3 | 5.1 | 18.2 | 21 | 1.5 | 3.9 | 3.2 | 2.4 | 5.3 | 18.6 | 404 | 2.5 | 4.9 | 202 | 4.5 | 324 | 1.7 | 4.6 | 162 | 3.4 |

22-FOOT SURFACES

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22 | U S 40, vicinity Baltimore, Md., asphalt with 3-foot concrete strip on each side | 1933 | 28 | 4.1 | 6.4 | 5.1 | 2.6 | 4.9 | 18.0 | 52 | 3.5 | 5.5 | 4.9 | 2.0 | 4.8 | 18.5 | | | | | | | | | | | | | | | | | |
| 22 | U S 111, vicinity Baltimore, Md., bituminous concrete with 3-foot concrete strip on each side | 1933 | 132 | 4.0 | 6.4 | 5.2 | 2.5 | 4.9 | 18.2 | 126 | 3.5 | 5.5 | 5.0 | 2.1 | 4.8 | 18.7 | 22 | 2.9 | 5.0 | 5.0 | 1.9 | 4.7 | 19.4 | 132 | 2.5 | 4.7 | 66 | 6.8 | 78 | 1.8 | 4.4 | 39 | 6.1 |
| 22 | Westfield Ave.—vicinity Rahway, N. J., concrete | 1934 | 368 | 3.6 | 6.0 | 4.9 | 3.0 | 5.3 | 18.4 | 299 | 2.9 | 5.2 | 4.5 | 2.7 | 5.6 | 19.1 | 31 | 2.8 | 5.3 | 4.0 | 2.4 | 5.4 | 19.2 | 496 | 2.9 | 5.3 | 248 | 5.7 | 344 | 2.2 | 5.2 | 172 | 4.3 |

TABLE 4.—*Weighted average distances on physically similar concrete roads (without paved shoulder) for various types of passages, vehicles moving in either the same or opposite direction*

PASSENGER CARS PASSING PASSENGER CARS

| Road width (feet) | Vehicles moving in same direction | | | Vehicles moving in opposite direction | | | Vehicles moving in same direction | Vehicles moving in opposite direction | Vehicles moving in same direction | | | Vehicles moving in opposite direction | | | Space used by vehicles moving in same direction (A+D) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | C | $E_p$ | Offset | C | $E_p$ | Offset | B | B | A | $E_c$ | Offset | A | $E_o$ | Offset | A+D | Percentage of road width |
| | *Feet* | *Feet* | *Feet* | *Feet* | *Feet* | *Feet* | *Feet* | *Feet* | *Feet* | *Feet* | *Feet* | *Feet* | *Feet* | *Feet* | *Feet* | *Percent* |
| 18 | 1.8 | 4.1 | −0.4 | 1.8 | 4.2 | −0.3 | 3.8 | 4.0 | 2.0 | 4.3 | −0.2 | 1.8 | 4.2 | −0.3 | 16.2 | 90.0 |
| 20 | 2.3 | 4.7 | −0.3 | 2.4 | 4.7 | −0.3 | 4.5 | 4.8 | 2.6 | 5.0 | 0 | 2.4 | 4.7 | −0.3 | 17.7 | 88.5 |
| 22 | 3.6 | 6.0 | +0.5 | 2.9 | 5.3 | −0.2 | 4.9 | 5.7 | 3.0 | 5.3 | −0.2 | 2.9 | 5.3 | −0.2 | 18.4 | 83.6 |
| PASSENGER CARS PASSING TRUCKS | | | | | | | | | | | | | | | | |
| 18 | 1.3 | 3.5 | −1.0 | | | | 3.2 | | 1.8 | 4.6 | +0.1 | | | | 16.7 | 92.7 |
| 20 | 1.8 | 4.0 | −1.0 | | | | 4.1 | | 2.3 | 5.1 | +0.1 | | | | 18.2 | 91.0 |
| 22 | 2.9 | 5.2 | −0.3 | | | | 4.5 | | 2.7 | 5.6 | +0.1 | | | | 19.1 | 86.9 |
| TRUCKS PASSING TRUCKS | | | | | | | | | | | | | | | | |
| 18 | 1.0 | 3.4 | −1.1 | 1.1 | 3.9 | −0.6 | 3.0 | 2.9 | 1.6 | 4.3 | −0.2 | 1.1 | 3.9 | −0.6 | 17.0 | 94.5 |
| 20 | 1.5 | 3.9 | −1.1 | 1.7 | 4.2 | −0.8 | 3.5 | 3.5 | 2.2 | 5.0 | 0 | 1.7 | 4.2 | −0.8 | 18.5 | 92.5 |
| 22 | 2.8 | 5.3 | −0.2 | 2.2 | 5.2 | −0.3 | 4.0 | 4.3 | 2.4 | 5.4 | −0.1 | 2.2 | 5.2 | −0.3 | 19.2 | 87.1 |

to the centerlines of traffic lanes and the position of the passing vehicle with respect to the midpoint referred to. Figure 9 is based upon the consolidated data of table 4.

Reference has previously been made to the shape of the distribution diagrams of figures 6, 7, and 8 as an index to the relief from road cramping that is experienced as road widths increase. The reduction in the height of the peaks and the increase in the width of the bases is not nearly so marked between the 18- and 20-foot as between the 20- and 22-foot surfaces.

Other evidence of the greater convenience of traffic on the wider roads also appears in figures 6 to 8. Passenger cars when passing other passenger cars on 18-foot roads were observed in a number of instances to run with their left wheels on the dirt shoulder. This did not happen on either of the two wider roads.

When the average positions of passing vehicles are studied in table 4 or figure 9 very little if any relief from cramping is apparent when the road width increases from 18 to 20 feet. Passenger cars when passing passenger cars can reduce their offset 0.1 foot but there is no change in the offsets of passing vehicles when passenger cars pass trucks or when trucks pass trucks. However, when the road width increases to 22 feet, there is a marked reduction of offsets and all types of vehicles seem to be much more comfortably accommodated. As far as offsets are concerned trucks, when passing trucks on the 22-foot pavement, are able to assume positions at least as favorable as passenger cars passing passenger cars on the 20-foot road and more favorable positions as far as edge distance with respect to the left wheels is concerned.

Figures 10 and 11 show frequency distributions similar to those of figures 6, 7, and 8, except that vehicles are moving in opposite directions. The change in shape of diagrams with increase in road width has a similar significance. It should be noted that no passenger cars were observed to run off on to the dirt shoulder as was the case when they were overtaking and passing other passenger cars on the 18-foot pavement.

The edge distances, positions of vehicle centers, and offsets are also shown for opposite direction passing in table 4. The offsets on all roads and for both types of vehicles are consistently negative. It may be concluded that this displacement to the driver's right is influenced by the presence of the oncoming vehicle since in same direction passing, critical vehicles on the average were seen to track in the center of their traffic lane.

From the foregoing it may be concluded that a pavement width of 18 feet is too narrow for either passenger cars alone or mixed traffic, that pavements 20 feet wide are inadequate for dense traffic involving wide trucks but are reasonably satisfactory for the more lightly traveled roads and for roads used infrequently by wide trucks, and that a width of 22 feet is entirely adequate and satisfactory for mixed traffic.

Speeds of all types of vehicles have steadily increased in the past and there is no definite assurance as to the future trend. It is believed that speed has an effect upon the position of motor vehicles on the pavement. A limited study was made to show the effect of speed upon the position of passenger cars relative to the right edge of the road. Frequency distribution diagrams for same-direction passing were drawn, as shown in figure 13, and the average position with respect to the right road edge was determined for the various speed groups. These positions were taken by the cars as they were being passed by other passenger cars on Westfield Avenue near Rahway, N. J. It is a 22-foot concrete highway. As the speed of the critical vehicle increases, its distance from the right road edge is increased. Additional curves for higher speeds were plotted and they show the same trend, but they are not presented because of the limited number of observations made.

It is felt that, of any effects speed may have upon vehicle position, the primary one is that involving greater edge distance. Thus, further increase in the speeds of vehicles will tend to make additional road width necessary.

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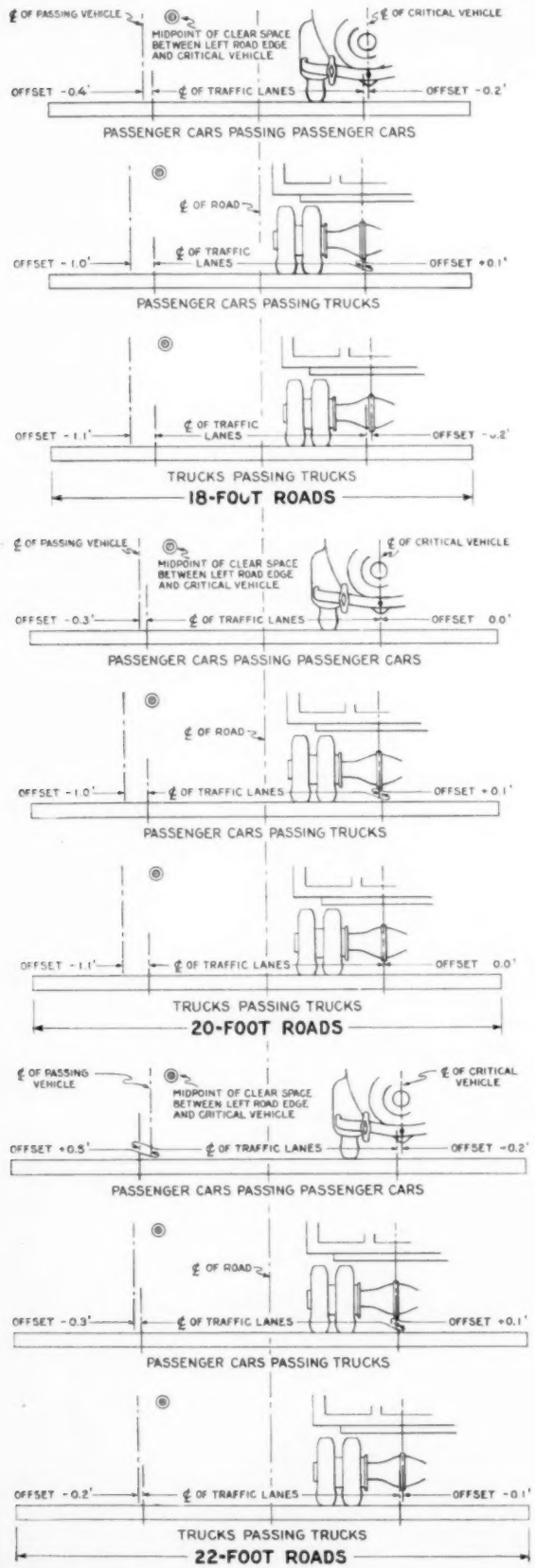



**FIGURE 9.—POSITION OF CRITICAL AND PASSING VEHICLES WITH RESPECT TO CENTERS OF TRAFFIC LANES AND CENTER OF MIDPOINT OF CLEAR SPACE BETWEEN LEFT ROAD EDGE AND CRITICAL VEHICLE FOR SAME DIRECTION PASSING. DIMENSIONS ARE WEIGHTED AVERAGES FOR PHYSICALLY SIMILAR CONCRETE ROADS. (WITHOUT PAVED SHOULDERS.)**

An interesting and rather surprising fact brought out by this study is the magnitude of the clearances taken by motor vehicles. This holds true for all types of passages whether in same-direction or opposite-direction passing. Quite contrary to the feeling that drivers often have of "just getting by" when they pass other vehicles, the large average clearances observed show that this feeling is generally unwarranted. The suggestion often made that narrow roads would be satisfactory were traffic composed solely of passenger cars is based on the fact that with small edge distances and clearances it is physically possible for vehicles to pass. The facts determined in this study definitely indicate that fairly large edge distances and clearances are desired by vehicle drivers.

### TRUCKS CAUSE SMALL INCREASE IN USED WIDTH OF SURFACE

Information on the influence of truck width upon the used width of highways (A+D) has been sought by those studying the allocation of highway costs to the various classes of vehicles. In order to bring out facts in this connection diagrams were drawn for cases in which passenger cars overtook and passed trucks. Each observed A+D dimension was plotted against the corresponding overall width of the critical truck. These data are shown in figure 12. It will be observed that the bulk of the data lies within the 7- to 8-foot range of truck widths, and that outside this range the points become fewer and more scattered. With this observation in mind, and because a recent survey shows approximately two-thirds of all trucks to have widths between 7 and 8 feet,[4] the method of least squares was applied to the data within this range only, to determine the average line.

This analysis is summarized in table 5 in which the increase in used space for a 1-foot increase in truck width is recorded. The results are quite variable but on the average clearly indicate that as truck widths increase, passing passenger cars shift further toward the left edge. The amount they shift, however, is small, 0.1 foot on

TABLE 5.—*Summary showing increase in used space for increase in truck width from 7 to 8 feet for passenger cars passing trucks on concrete roads*

| Location of road | Road width | Year of observation | Number of observations | Used space (A+D) | | Increase in A+D for 1 foot increase in truck width |
|---|---|---|---|---|---|---|
| | | | | Truck width 7 feet | Truck width 8 feet | |
| | *Feet* | | | *Feet* | *Feet* | *Feet* |
| U S 40, vicinity Aberdeen, Md. | 18 | 1933 | 24 | 16.29 | 16.57 | 0.28 |
| U S 40, vicinity Aberdeen, Md. | 18 | 1934 | 57 | 16.54 | 16.82 | .28 |
| U S 111, Maryland line to York, Pa. | 18 | 1934 | 111 | 16.63 | 16.76 | .13 |
| U S 22, vicinity Allentown, Pa. | 18 | 1934 | 169 | 16.73 | 16.74 | .01 |
| Weighted average for 18-foot road | | | | 16.64 | 16.75 | .11 |
| U S 40, vicinity Aberdeen, Md. | 20 | 1933 | 56 | 17.85 | 18.51 | .66 |
| U S 40, vicinity Aberdeen, Md. | 20 | 1934 | 98 | 18.23 | 18.37 | .14 |
| U S 22, vicinity Allentown, Pa. | 20 | 1934 | 267 | 17.94 | 18.29 | .35 |
| Weighted average for 20-foot road | | | | 18.00 | 18.34 | .34 |
| Westfield Avenue, vicinity Rahway, N. J. | 22 | 1934 | 147 | 18.80 | 19.46 | .66 |

[4] A Study of the Weights and Dimensions of Trucks by J. T. Thompson. Public Roads, vol. 16, no. 3, May 1935.

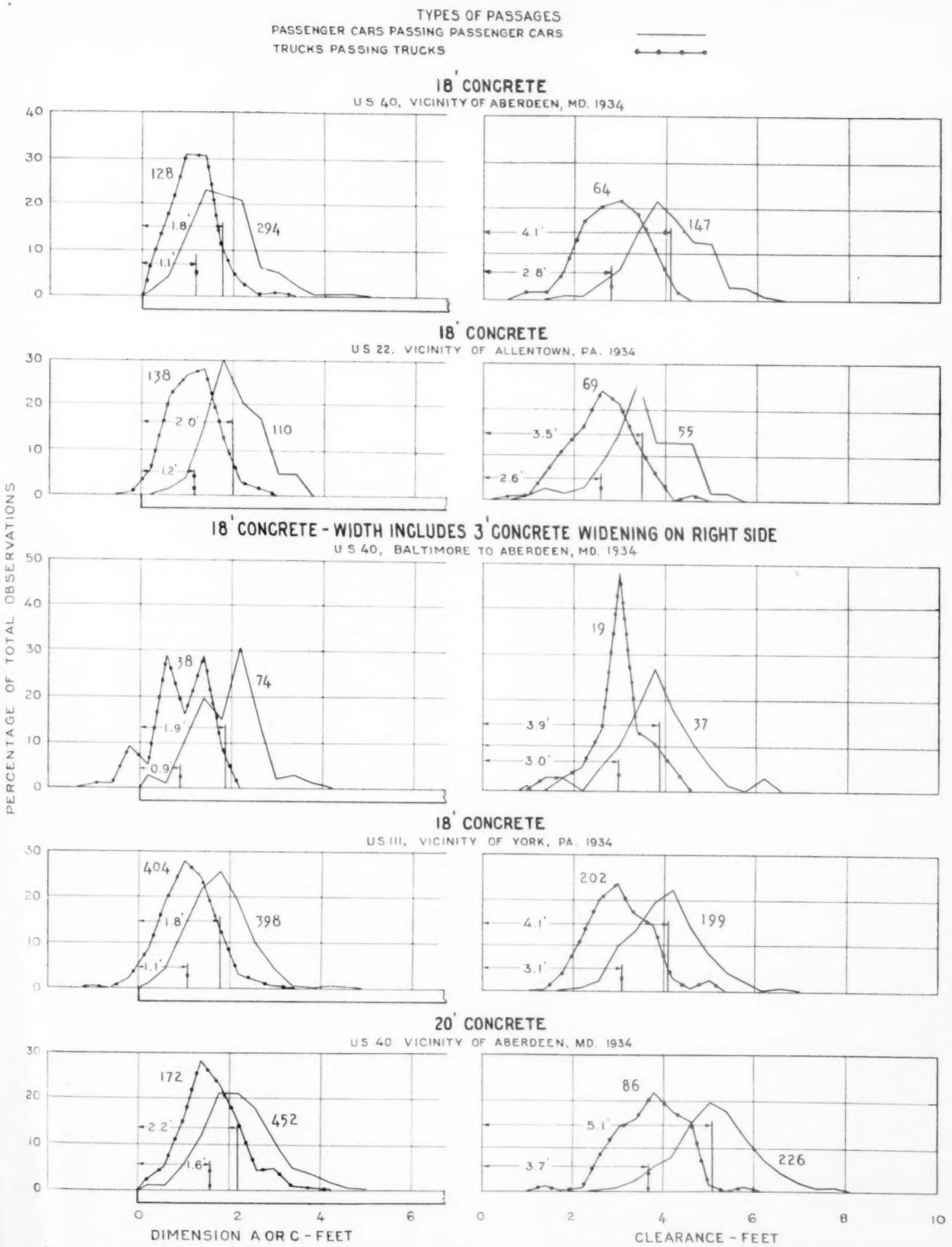
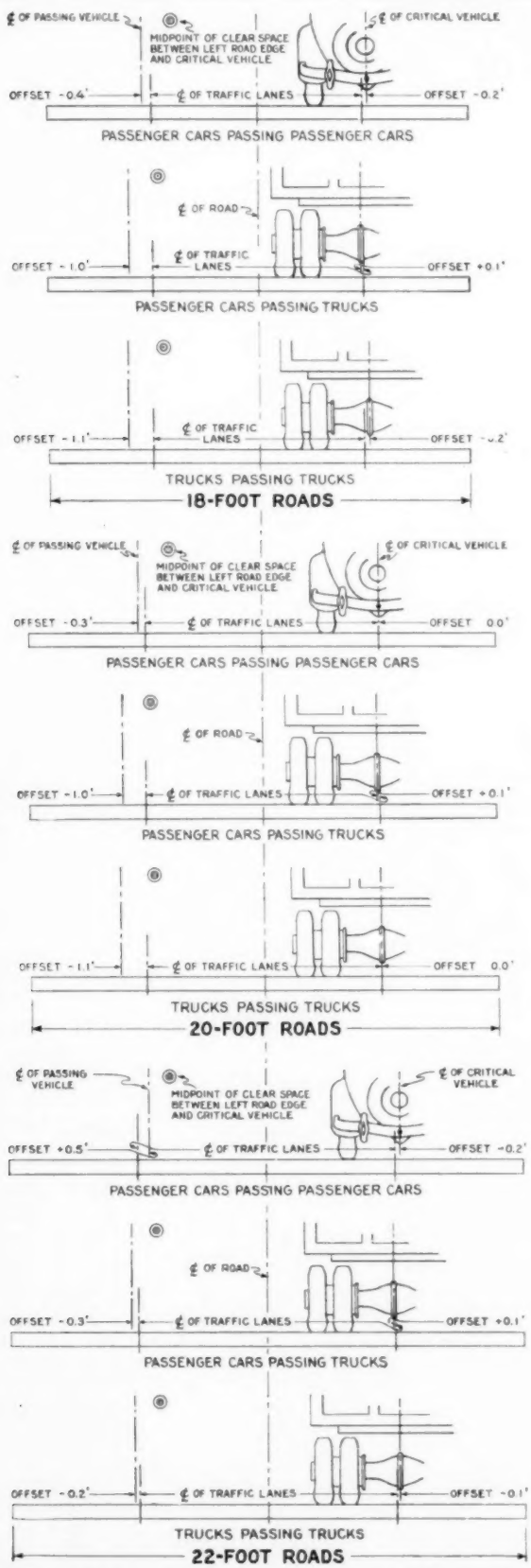



FIGURE 10.—FREQUENCY DISTRIBUTION OF EDGE DISTANCES AND CLEARANCES FOR OPPOSITE DIRECTION PASSING.

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### TRUCKS CAUSE SMALL INCREASE IN USED WIDTH OF SURFACE

Information on the influence of truck width upon the used width of highways (A+D) has been sought by those studying the allocation of highway costs to the various classes of vehicles. In order to bring out facts in this connection diagrams were drawn for cases in which passenger cars overtook and passed trucks. Each observed A+D dimension was plotted against the corresponding overall width of the critical truck. These data are shown in figure 12. It will be observed that the bulk of the data lies within the 7- to 8-foot range of truck widths, and that outside this range the points become fewer and more scattered. With this observation in mind, and because a recent survey shows approximately two-thirds of all trucks to have widths between 7 and 8 feet,[4] the method of least squares was applied to the data within this range only, to determine the average line.

This analysis is summarized in table 5 in which the increase in used space for a 1-foot increase in truck width is recorded. The results are quite variable but on the average clearly indicate that as truck widths increase, passing passenger cars shift further toward the left edge. The amount they shift, however, is small, 0.1 foot on

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|---|---|---|---|---|---|---|
| | | | | Truck width 7 feet | Truck width 8 feet | |
| | *Feet* | | | *Feet* | *Feet* | *Feet* |
| U S 40, vicinity Aberdeen, Md. | 18 | 1933 | 24 | 16.29 | 16.57 | 0.28 |
| U S 40, vicinity Aberdeen, Md. | 18 | 1934 | 57 | 16.54 | 16.82 | .28 |
| U S 111, Maryland line to York, Pa. | 18 | 1934 | 111 | 16.63 | 16.76 | .13 |
| U S 22, vicinity Allentown, Pa. | 18 | 1934 | 169 | 16.73 | 16.74 | .01 |
| Weighted average for 18-foot road | | | | 16.64 | 16.75 | .11 |
| U S 40, vicinity Aberdeen, Md. | 20 | 1933 | 56 | 17.85 | 18.51 | .66 |
| U S 40, vicinity Aberdeen, Md. | 20 | 1934 | 98 | 18.23 | 18.37 | .14 |
| U S 22, vicinity Allentown, Pa. | 20 | 1934 | 267 | 17.94 | 18.29 | .35 |
| Weighted average for 20-foot road | | | | 18.00 | 18.34 | .34 |
| Westfield Avenue, vicinity Rahway, N. J. | 22 | 1934 | 147 | 18.80 | 19.46 | .66 |

[4] A Study of the Weights and Dimensions of Trucks by J. T. Thompson, Public Roads, vol. 16, no. 3, May 1935.

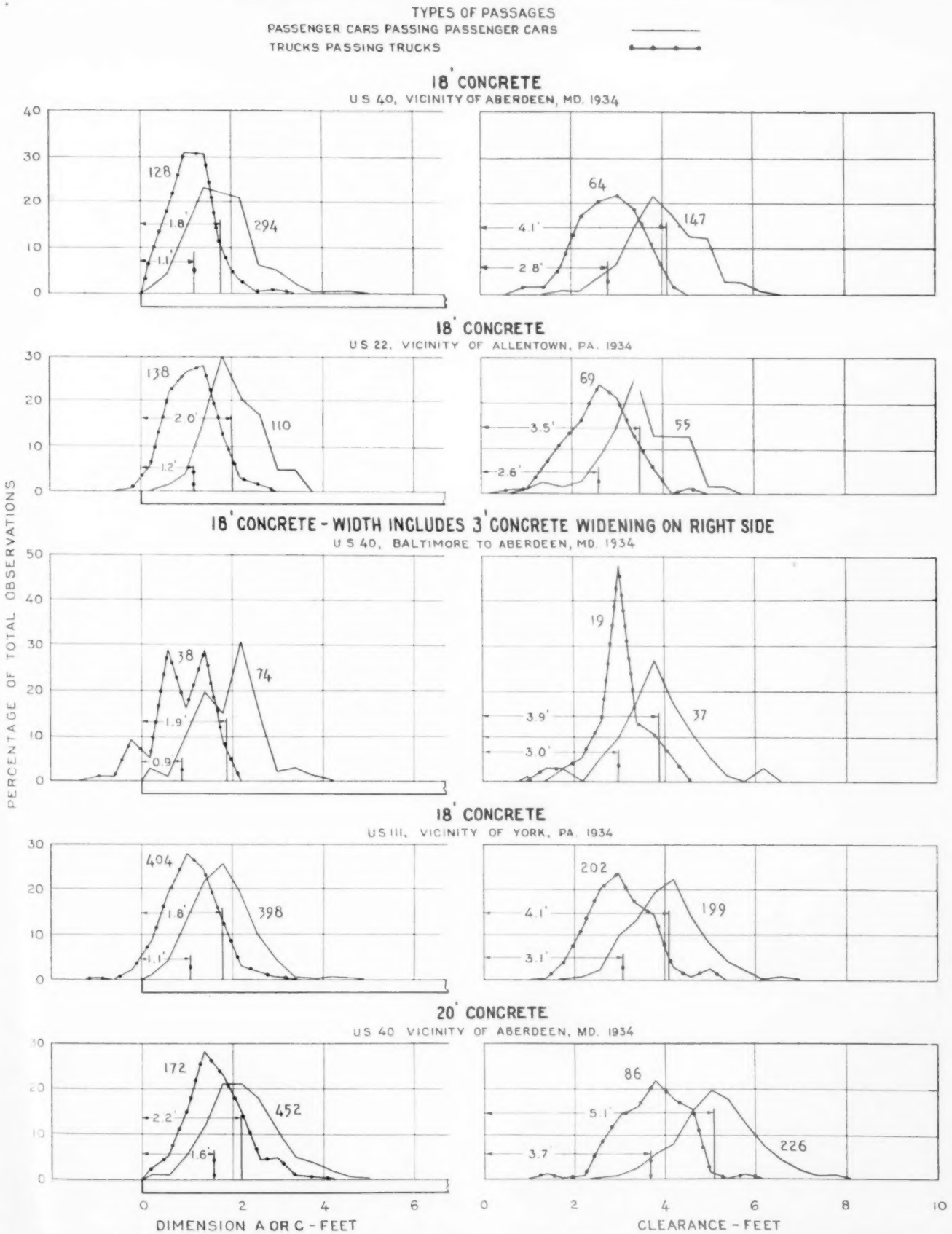


FIGURE 10.—FREQUENCY DISTRIBUTION OF EDGE DISTANCES AND CLEARANCES FOR OPPOSITE DIRECTION PASSING.

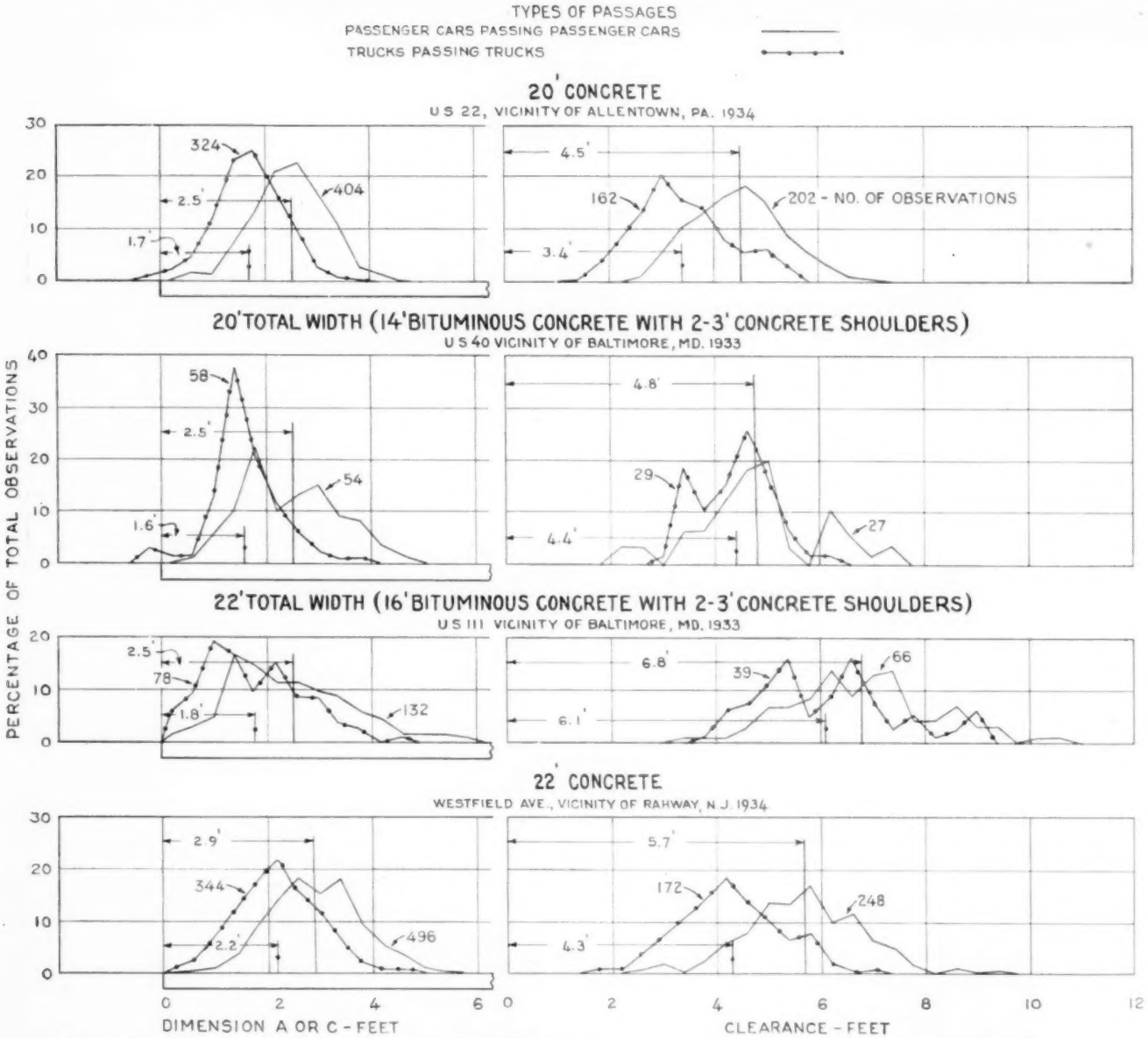


FIGURE 11.—FREQUENCY DISTRIBUTION OF EDGE DISTANCES AND CLEARANCES FOR OPPOSITE DIRECTION PASSING.

the narrow 18-foot road, 0.3 foot on the less restricted 20-foot road, and 0.7 foot on the relatively wide 22-foot road where greater choice is known to exist. This increase in used width of road should not be attributed particularly to trucks of large rated capacity. In the study of truck widths referred to above it was found that wide trucks are approximately evenly distributed among the rated capacity classes from 1½ tons to 5 tons. Eight feet is the common legal maximum width and of observed trucks of this width there were more 1½-ton trucks than 5-ton trucks.

Figures 14 to 19 present additional information on the influence of truck widths on the positions of passenger vehicles in passing trucks. An analysis was made by truck-width classes of the observations in which passenger cars in overtaking and passing trucks were, for any reason, within 1 foot of the left edge of the pavement or off of it entirely. The ends of the horizontal lines shown on the diagrams represent the positions of the right rear wheel of the critical truck and the left rear wheel of the passing car. The average edge distances found for the particular road width is designated, and also the average clearance. Truck widths were broken down into four classes: 6—7, 7—7.5, 7.5—8, and over 8 feet. The information collected on the 18-foot and 20-foot roads is summarized in table 6. The number of observations on 22-foot roads where passenger vehicles, in passing trucks, were within 1 foot of the left edge was negligible.

Table 6 shows that as truck widths increase the percentage of unfavorable left edge distances, as here defined, remains approximately constant. On the 20-foot road, which more nearly approaches a satisfactory width, this is particularly true throughout the range of truck widths, even for trucks exceeding the common legal limit of 8 feet. On the 18-foot road the percentage of such cases remains approximately constant until extralegal widths are reached, when there is a very sudden increase. Few trucks of extralegal width were observed and the sample is rather small to be considered a basis for definite conclusions.

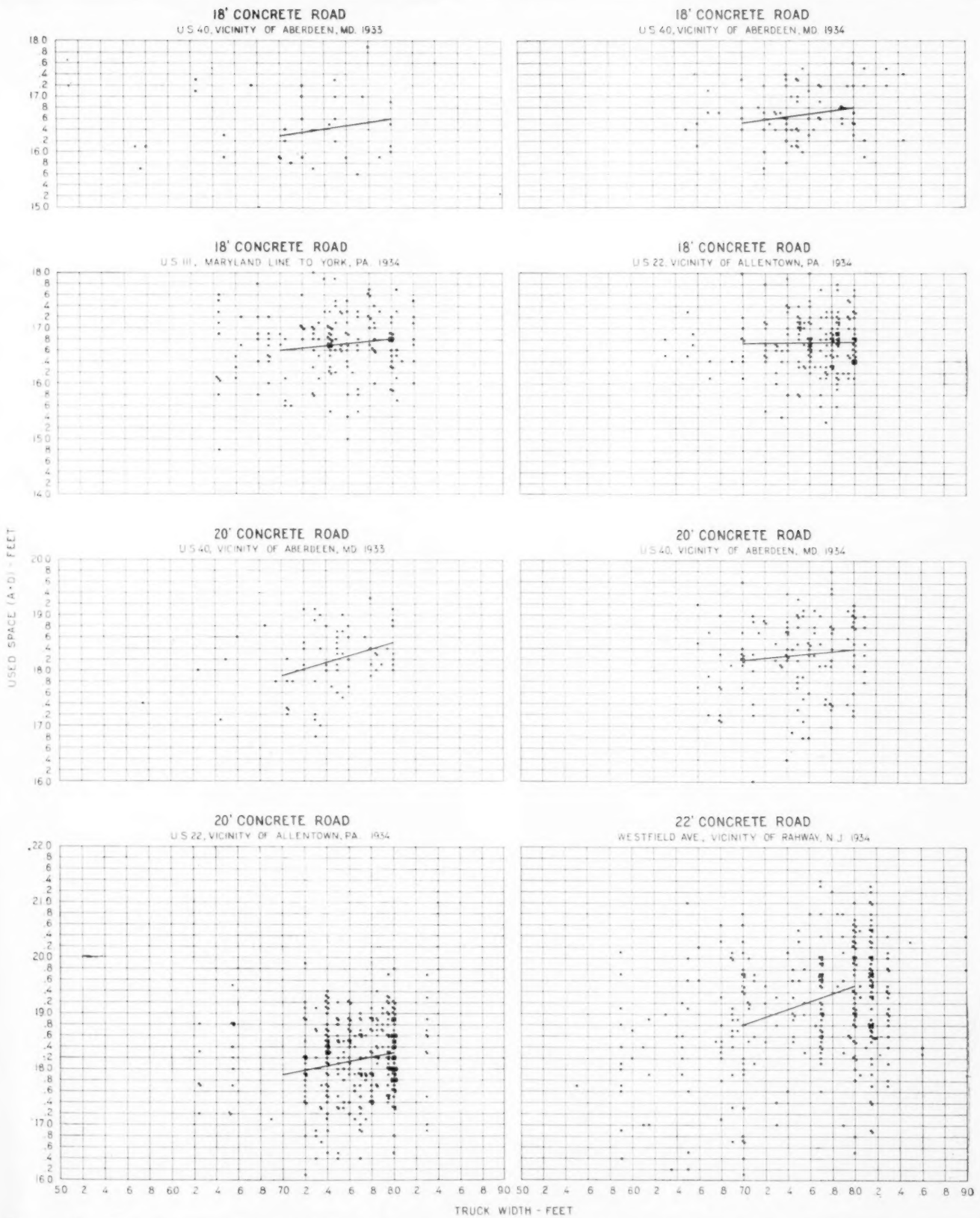


FIGURE 12.—TRUCK WIDTHS COMPARED WITH USED SPACE FOR PASSENGER VEHICLES PASSING TRUCKS IN SAME DIRECTION. INDIVIDUAL CASES PLOTTED AND TREND LINE DETERMINED BY METHOD OF LEAST SQUARES.

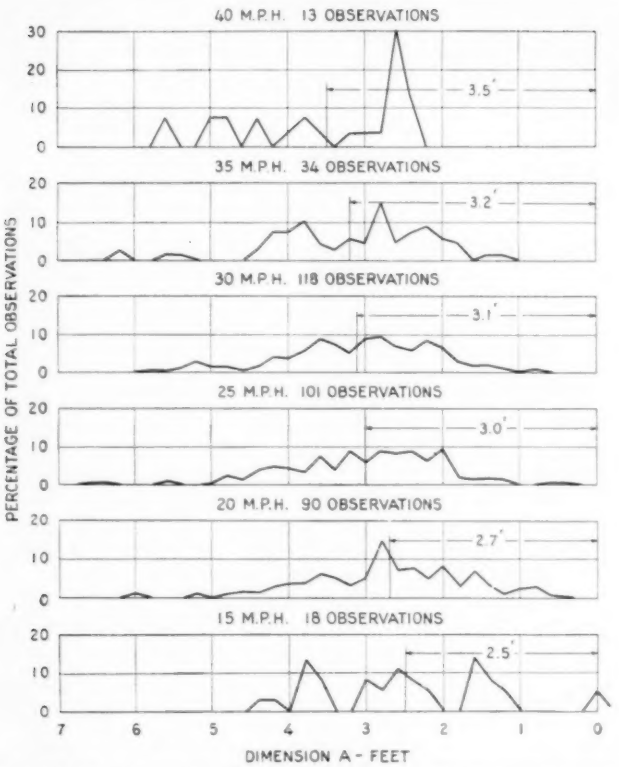


FIGURE 13.—AVERAGE POSITION OF OUTER WHEEL OF CRITICAL VEHICLE FROM RIGHT EDGE OF ROAD (DIMENSION A) AT VARIOUS SPEEDS. WESTFIELD AVENUE 22-FOOT CONCRETE ROAD.

TABLE 6.—*Results of analysis of passenger cars passing trucks of various widths where passing vehicle was within 1 foot of the left road edge or off the road* [1]

18-FOOT CONCRETE ROAD

| Truck width (feet) | Number of observations of passenger cars passing trucks in each width class | Percentage of total | Observations where the passing vehicle was within 1 foot of left edge or off road | |
|---|---|---|---|---|
| | | | *Number* | *Percent* |
| 6.0–7.0 | 67 | 15 | 18 | 27 |
| 7.0–7.5 | 138 | 32 | 47 | 34 |
| 7.5–8.0 | 213 | 48 | 66 | 31 |
| Over 8.0 | 23 | 5 | 11 | 48 |
| Total | 441 | 100 | 142 | 32 |

20-FOOT CONCRETE ROAD

| | | | | |
|---|---|---|---|---|
| 6.0–7.0 | 45 | 9 | 6 | 13 |
| 7.0–7.5 | 157 | 33 | 21 | 13 |
| 7.5–8.0 | 258 | 54 | 36 | 14 |
| Over 8.0 | 20 | 4 | 3 | 15 |
| Total | 480 | 100 | 66 | 14 |

[1] Tabulation for 22-foot road omitted because of the small number of observations where the vehicle was within 1 foot of the left edge or off the road.

From the foregoing it may be argued that the width of the truck is of less importance, comparatively, than the use of excessive right edge distance, excessive clearance, or a combination of the two in causing the passing vehicle to travel close to the left edge of the pavement.

Detailed study of figures 14 to 19 shows that, in general, where less than normal clearance between vehicles was found, the passing vehicle was forced over by the selfish position taken by the passed vehicle. In

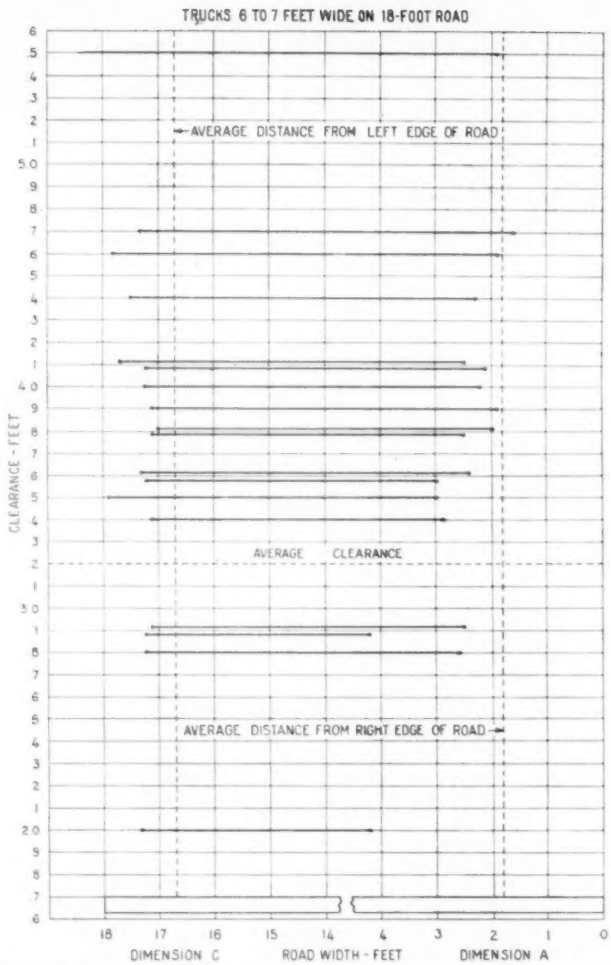


FIGURE 14.—GRAPHICAL PRESENTATION OF EDGE DISTANCES AND CLEARANCE WHERE PASSENGER VEHICLES, IN OVERTAKING AND PASSING TRUCKS, PLACED THE LEFT WHEEL WITHIN 1 FOOT OF THE EDGE OF PAVEMENT. THE ENDS OF THE HORIZONTAL LINES SHOW THE POSITION OF THE RIGHT REAR WHEEL OF TRUCKS AND OF THE LEFT REAR WHEEL OF THE PASSENGER VEHICLES. THE AVERAGE DISTANCES SHOWN BY DASH LINES ARE FOR ALL OBSERVATIONS OF PASSENGER VEHICLES PASSING TRUCKS ON 18-FOOT PAVEMENTS REGARDLESS OF DISTANCES TO EDGES.

nearly all passings observed, where the clearance between vehicles was less than the average, the critical vehicle was taking more than the average edge distance. However, examination of those passings where the passing vehicle was close to the left edge shows more cases where the average clearance between vehicles was exceeded than there were below the average clearance. This suggests that about as many drivers run close to the left edge or off the road because of their own driving habits as are forced to by drivers of passed vehicles.

A comparison of the road width used in passing (A+D) in table 4 shows that passenger cars passing passenger cars used 0.8 foot less space than trucks passing trucks on each of the three road widths. Passages involving trucks and passenger cars required an intermediate amount of space.

The last column in table 4 shows the used space expressed as a percentage of road width. As the road width increases there is, for each vehicle class, a decrease of about 2 percent between the 18- and the 20-

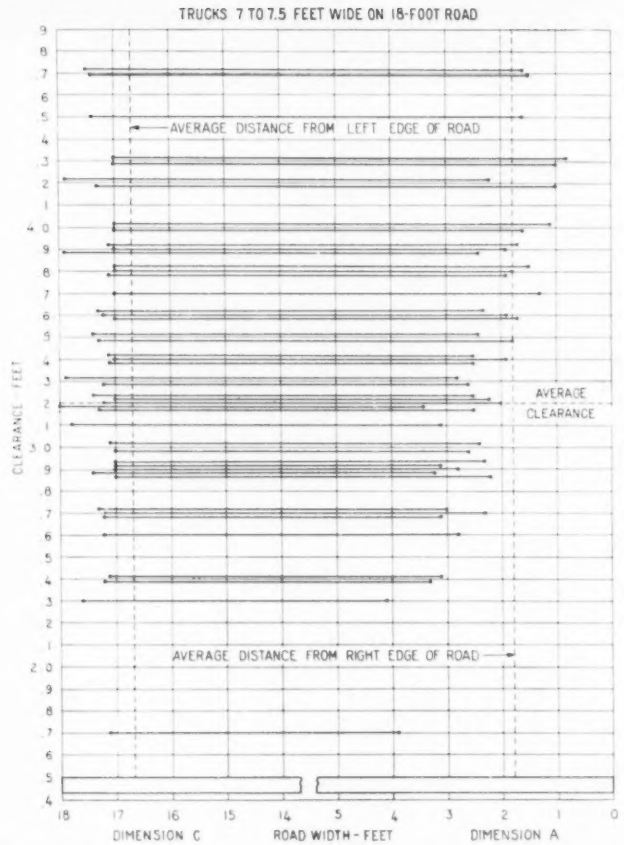


FIGURE 15.—GRAPHICAL PRESENTATION OF EDGE DISTANCES AND CLEARANCE WHERE PASSENGER VEHICLES, IN OVERTAKING AND PASSING TRUCKS, PLACED THE LEFT WHEEL WITHIN 1 FOOT OF THE EDGE OF PAVEMENT. THE ENDS OF THE HORIZONTAL LINES SHOW THE POSITION OF THE RIGHT REAR WHEEL OF TRUCKS AND OF THE LEFT REAR WHEEL OF THE PASSENGER VEHICLES. THE AVERAGE DISTANCES SHOWN BY DOTTED LINES ARE FOR ALL OBSERVATIONS OF PASSENGER VEHICLES PASSING TRUCKS ON 18-FOOT PAVEMENTS REGARDLESS OF DISTANCES TO EDGES.

foot width followed by a much larger decrease between the 20- and 22-foot widths. This is again indicative of narrowness in the 18- and 20-foot roads and also of the release from width restriction that is experienced when a width of 22 feet is reached.

Figure 20 shows passenger cars passing on a 20-foot road.

### CONCLUSIONS

1. Drivers of critical vehicles when being overtaken and passed tend to follow the centerline of their own traffic lane very closely.

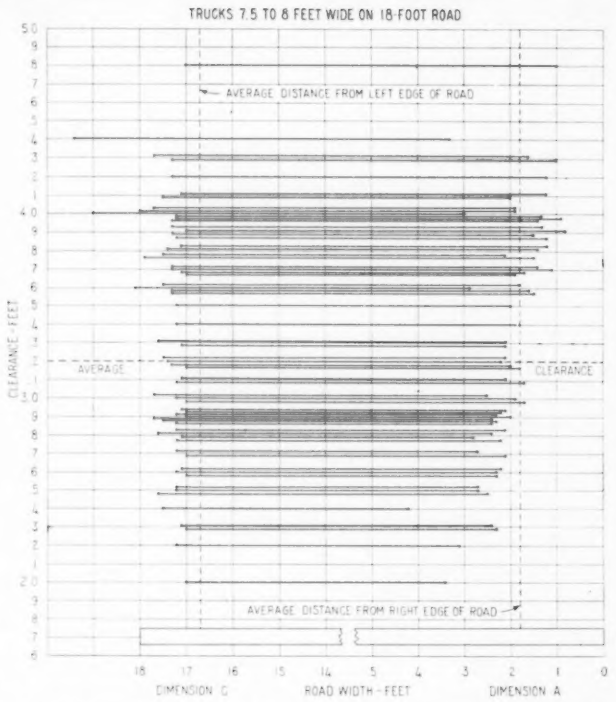


FIGURE 16.—GRAPHICAL PRESENTATION OF EDGE DISTANCES AND CLEARANCE WHERE PASSENGER VEHICLES, IN OVERTAKING AND PASSING TRUCKS, PLACED THE LEFT WHEEL WITHIN 1 FOOT OF THE EDGE OF PAVEMENT. THE ENDS OF THE HORIZONTAL LINES SHOW THE POSITION OF THE RIGHT REAR WHEEL OF TRUCKS AND OF THE LEFT REAR WHEEL OF THE PASSENGER VEHICLES. THE AVERAGE DISTANCES SHOWN BY DOTTED LINES ARE FOR ALL OBSERVATIONS OF PASSENGER VEHICLES PASSING TRUCKS ON 18-FOOT PAVEMENTS REGARDLESS OF DISTANCES TO EDGES.

2. Pavements of 18-foot width are too narrow for modern passenger cars alone or for modern mixed traffic. Pavements of 20-foot width are reasonably adequate for light-traffic roads used infrequently by wide trucks but are inadequate for heavy mixed traffic. Pavements of 22-foot width are entirely adequate for modern mixed traffic.

3. When passenger cars occupy unfavorable positions with respect to the left road edge in passing trucks, they do so because of the habits of the drivers as often as because of their being crowded over by the passed vehicle.

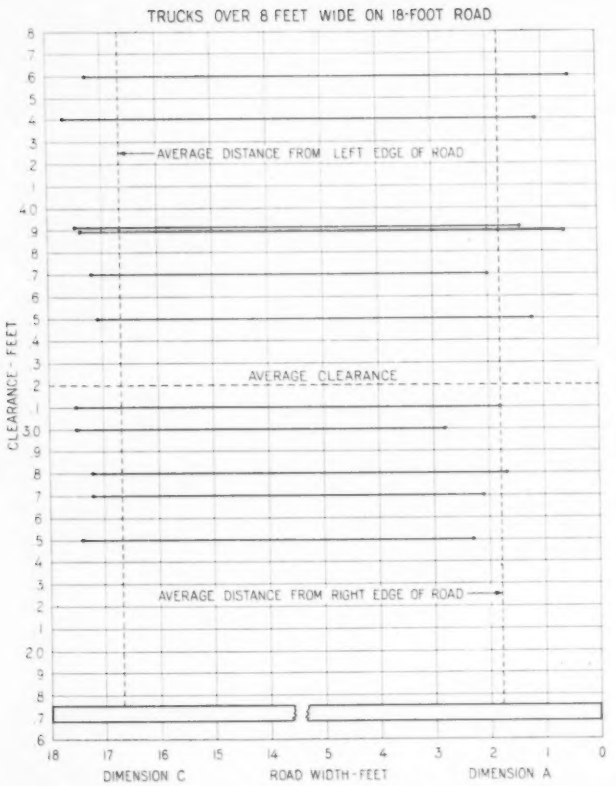


FIGURE 17.—GRAPHICAL PRESENTATION OF EDGE DISTANCES AND CLEARANCE WHERE PASSENGER VEHICLES, IN OVERTAKING AND PASSING TRUCKS, PLACED THE LEFT WHEEL WITHIN 1 FOOT OF THE EDGE OF PAVEMENT. THE ENDS OF THE HORIZONTAL LINES SHOW THE POSITION OF THE RIGHT REAR WHEEL OF TRUCKS AND OF THE LEFT REAR WHEEL OF THE PASSENGER VEHICLES. THE AVERAGE DISTANCES SHOWN BY DOTTED LINES ARE FOR ALL OBSERVATIONS OF PASSENGER VEHICLES PASSING TRUCKS ON 18-FOOT PAVEMENTS REGARDLESS OF DISTANCES TO EDGES.

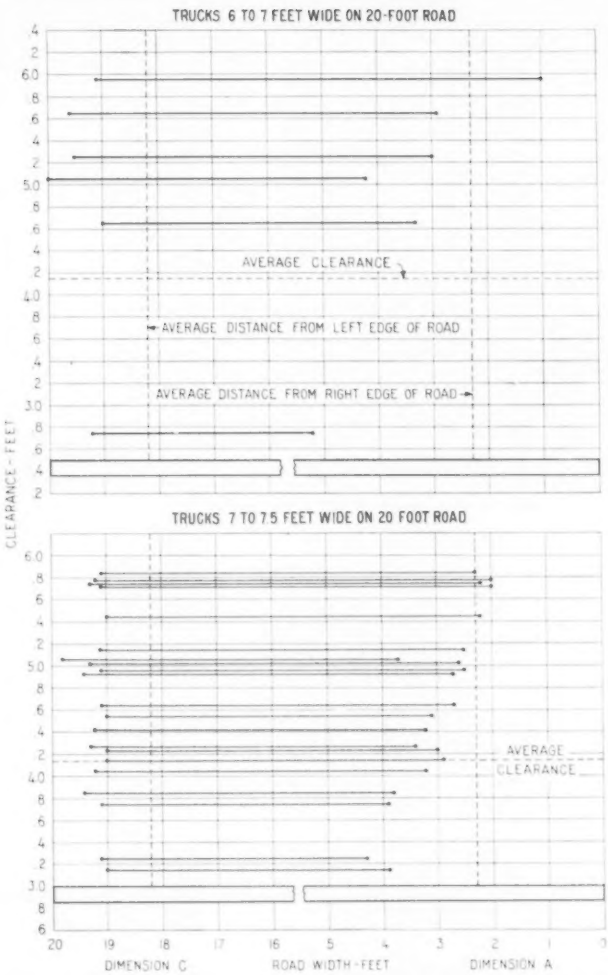


FIGURE 18.—GRAPHICAL PRESENTATION OF EDGE DISTANCES AND CLEARANCE WHERE PASSENGER VEHICLES, IN OVERTAKING AND PASSING TRUCKS, PLACED THE LEFT WHEEL WITHIN 1 FOOT OF THE EDGE OF PAVEMENT. THE ENDS OF THE HORIZONTAL LINES SHOW THE POSITION OF THE RIGHT REAR WHEEL OF TRUCKS AND OF THE LEFT REAR WHEEL OF THE PASSENGER VEHICLES. THE AVERAGE DISTANCES SHOWN BY DOTTED LINES ARE FOR ALL OBSERVATIONS OF PASSENGER VEHICLES PASSING TRUCKS ON 20-FOOT PAVEMENTS REGARDLESS OF DISTANCES TO EDGES.

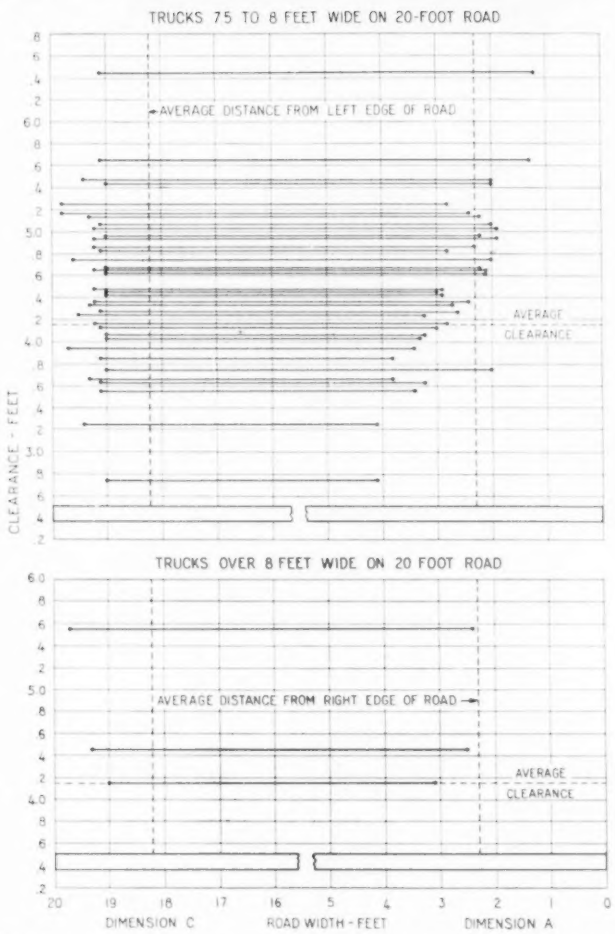


FIGURE 19.—GRAPHICAL PRESENTATION OF EDGE DISTANCES AND CLEARANCE WHERE PASSENGER VEHICLES, IN OVERTAKING AND PASSING TRUCKS, PLACED THE LEFT WHEEL WITHIN ONE FOOT OF THE EDGE OF PAVEMENT. THE ENDS OF THE HORIZONTAL LINES SHOW THE POSITION OF THE RIGHT REAR WHEEL OF TRUCKS AND OF THE LEFT REAR WHEEL OF THE PASSENGER VEHICLES. THE AVERAGE DISTANCES SHOWN BY DOTTED LINES ARE FOR ALL OBSERVATIONS OF PASSENGER VEHICLES PASSING TRUCKS ON 20-FOOT PAVEMENTS REGARDLESS OF DISTANCES TO EDGES.

FIGURE 20.—PASSING OPERATIONS ON A 20-FOOT ROAD.

## PUBLICATION ON HIGHWAY BRIDGES AVAILABLE

"Highway Bridge Surveys", a booklet which describes with clarity and in complete detail the importance of the various kinds of data needed in the design of bridges, is being reprinted by the Superintendent of Documents and will soon be available.

The importance of a comprehensive and accurate bridge survey can hardly be overemphasized, the booklet states. Incomplete or inaccurate information may quickly result in bridge failure, involving financial loss as well as possible loss of human life. All pertinent data for each bridge should be obtained and filed, as each structure built may be considered to constitute a practical experiment in bridge building. Such service records furnish additional data that further advance the art of bridge building.

Civil engineering instructors and students will find this publication invaluable as an exhaustive but concise textbook, complete with sample forms for recording data, illustrations, diagrams, necessary formulas, etc.

Written by Mr. C. B. McCullough, an outstanding authority on bridges, this 76-page booklet was first issued several years ago. Published as United States Department of Agriculture Technical Bulletin No. 55, "Highway Bridge Surveys" may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 20 cents per copy. A 25-percent price reduction can be obtained on single orders for 100 or more copies.

# DISPOSITION OF STATE MOTOR-FUEL TAX RECEIPTS, 1936

[Compiled for calendar year from reports of State authorities]

| State | Net total receipts of calendar year | Adjustments due to undistributed balances, etc.[1] | Net total funds distributed [2] | Expenses of collection and administration | For other administrative purposes [3] | For State highway purposes | | | | | | | For local roads and streets [6] | | | | For other highway purposes (park and forest roads, etc.) | For nonhighway purposes | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Construction, maintenance, and administration [4] | State highway police | Service of State highway obligations | | | Total | Total for State highway purposes | For work on county and local roads | For work on city streets [7] | Service of local highway obligations | Total | | To general funds [5] | | For relief of unemployment or destitution | For education | For other purposes | Total |
| | | | | | | | | State highway bonds | State-assumed local obligations [8] | Notes and other short-term loans | | | | | | | | Inspection fees, dealers' licenses, etc.[9] | Motor-fuel tax | | | | |
| | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* |
| Alabama | 11,803 | −78 | 11,725 | 51 | 49 | 4,374 | ------ | 1,508 | ------ | ------ | 1,508 | 5,882 | 5,743 | ------ | ------ | 5,743 | ------ | ------ | ------ | ------ | [10] 7 | 7 |
| Arizona | 3,843 | ------ | 3,843 | 63 | ------ | 2,533 | 91 | ------ | ------ | ------ | ------ | 2,624 | *1,149 | ------ | ------ | 1,149 | ------ | ------ | ------ | ------ | ------ | ------ |
| Arkansas | 9,235 | −23 | 9,212 | 341 | 3 | 2,292 | ------ | 3,536 | 2,249 | 58 | 5,843 | 8,135 | 572 | ------ | 84 | 656 | ------ | 77 | ------ | ------ | ------ | 77 |
| California | 43,008 | 330 | 43,338 | 139 | ------ | 28,547 | ------ | ------ | ------ | ------ | ------ | 28,547 | *10,713 | 3,939 | ------ | 14,652 | ------ | ------ | ------ | ------ | ------ | ------ |
| Colorado | 6,833 | −10 | 6,823 | 99 | 4 | 4,733 | 179 | ------ | ------ | ------ | ------ | 4,912 | [11] 1,808 | ------ | ------ | 1,808 | ------ | ------ | ------ | ------ | ------ | ------ |
| Connecticut | 8,835 | −182 | 8,653 | 51 | ------ | 7,930 | ------ | ------ | 672 | ------ | 672 | 8,602 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Delaware | 1,856 | ------ | 1,856 | 12 | ------ | 1,035 | 119 | 45 | 325 | ------ | 370 | 1,524 | [12] 320 | ------ | ------ | 320 | ------ | ------ | ------ | ------ | ------ | ------ |
| Florida | 20,317 | −15 | 20,302 | 19 | 358 | 8,360 | 146 | ------ | 2,846 | ------ | 2,846 | 11,352 | 12 | ------ | 5,693 | 5,705 | ------ | ------ | 2,846 | ------ | [13] 22 | 2,868 |
| Georgia | 17,493 | ------ | 17,493 | 522 | ------ | 8,853 | ------ | ------ | 2,403 | ------ | 2,403 | 11,256 | 2,814 | ------ | ------ | 2,814 | ------ | ------ | ------ | 2,901 | ------ | 2,901 |
| Idaho | 3,696 | −12 | 3,684 | 13 | ------ | 3,671 | ------ | ------ | ------ | ------ | ------ | 3,671 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Illinois | 33,819 | 7 | 33,826 | 175 | 261 | 11,097 | ------ | ------ | ------ | ------ | ------ | 11,097 | *7,658 | 7,422 | ------ | 15,080 | ------ | 99 | ------ | 4,417 | 2,697 | ------ | 7,213 |
| Indiana | 21,154 | −2,857 | 18,297 | 84 | 70 | 7,449 | ------ | ------ | ------ | ------ | ------ | 7,449 | 8,245 | 2,061 | ------ | 10,306 | ------ | 388 | ------ | ------ | ------ | ------ | 388 |
| Iowa | 12,196 | 5 | 12,201 | 78 | 23 | 3,470 | ------ | ------ | 3,250 | ------ | 3,250 | 6,720 | *5,380 | ------ | ------ | 5,380 | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Kansas | 9,520 | −61 | 9,459 | 314 | 102 | 5,898 | 12 | ------ | 681 | ------ | 681 | 6,591 | 2,452 | ------ | ------ | 2,452 | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Kentucky | 11,277 | 253 | 11,530 | 35 | ------ | 11,402 | 49 | ------ | ------ | ------ | ------ | 11,451 | 44 | ------ | ------ | 44 | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Louisiana | 12,207 | −939 | 11,268 | 94 | ------ | ------ | ------ | 7,687 | ------ | ------ | 7,687 | 7,687 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 1,576 | 956 | [14] 955 | 3,487 |
| Maine | 5,202 | 57 | 5,259 | 16 | ------ | 3,172 | 150 | 1,411 | ------ | ------ | 1,411 | 4,733 | 510 | ------ | ------ | 510 | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Maryland | 8,921 | ------ | 8,921 | 34 | ------ | 3,107 | ------ | 1,534 | ------ | ------ | 1,534 | 4,641 | 993 | 2,667 | 572 | 4,232 | ------ | ------ | ------ | ------ | ------ | [15] 14 | 14 |
| Massachusetts | 18,448 | 15 | 18,463 | 50 | ------ | 7,414 | 255 | 1,319 | ------ | ------ | 1,319 | 8,988 | 2,879 | ------ | 353 | 3,232 | [16] 751 | ------ | 3,650 | [17] 1,792 | ------ | ------ | 5,442 |
| Michigan | 25,739 | −141 | 25,598 | 141 | ------ | 15,182 | ------ | 3,720 | ------ | ------ | 3,720 | 18,902 | *6,550 | ------ | ------ | 6,550 | ------ | 5 | ------ | ------ | ------ | ------ | 5 |
| Minnesota | 12,329 | −85 | 12,244 | 113 | ------ | 8,435 | 192 | ------ | ------ | ------ | ------ | 8,627 | *3,421 | ------ | ------ | 3,421 | ------ | 83 | ------ | ------ | ------ | ------ | 83 |
| Mississippi | 9,062 | −228 | 8,834 | 75 | 56 | 2,905 | 30 | 1,761 | ------ | 236 | 1,997 | 4,932 | *3,753 | ------ | ------ | 3,753 | 18 | ------ | ------ | ------ | ------ | ------ | ------ |
| Missouri | 11,188 | ------ | 11,188 | 55 | 50 | 6,794 | 148 | 4,075 | ------ | ------ | 4,075 | 11,017 | ------ | ------ | ------ | ------ | ------ | 66 | ------ | ------ | ------ | ------ | 66 |
| Montana | 4,455 | −149 | 4,306 | 22 | ------ | 4,150 | ------ | 134 | ------ | ------ | 134 | 4,284 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Nebraska | 11,320 | −30 | 11,290 | 102 | ------ | 5,594 | ------ | ------ | ------ | ------ | ------ | 5,594 | *3,022 | 334 | ------ | 3,356 | ------ | ------ | ------ | 2,238 | ------ | ------ | 2,238 |
| Nevada | 1,080 | ------ | 1,080 | 3 | ------ | 1,044 | 19 | ------ | 14 | ------ | 14 | 1,077 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| New Hampshire | 3,181 | −1 | 3,180 | [18] | ------ | 2,105 | ------ | 800 | ------ | ------ | 800 | 2,905 | 133 | ------ | [19] 142 | 275 | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| New Jersey | 19,106 | 1,432 | 20,538 | 121 | ------ | 2,051 | ------ | 7,636 | ------ | ------ | 7,636 | 9,687 | 3,120 | ------ | 345 | 3,465 | 16 | ------ | ------ | 5,388 | 1,285 | [20] 576 | 7,249 |
| New Mexico | 3,410 | −25 | 3,385 | 75 | ------ | 1,746 | ------ | 1,564 | ------ | ------ | 1,564 | 3,310 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| New York [21] | 55,709 | 1,060 | 56,769 | 91 | ------ | 5,544 | 599 | 3,874 | ------ | ------ | 3,874 | 10,017 | *8,104 | ------ | ------ | 8,104 | ------ | [22] 38,557 | ------ | ------ | ------ | ------ | 38,557 |
| North Carolina | 20,961 | ------ | 20,961 | [23] | 30 | 4,972 | 203 | 6,641 | 407 | ------ | 7,048 | 12,223 | [12] 6,672 | ------ | ------ | 6,672 | ------ | 932 | 1,104 | ------ | ------ | ------ | 2,036 |
| North Dakota | 2,301 | 30 | 2,331 | 25 | 56 | 1,476 | 24 | ------ | ------ | ------ | ------ | 1,500 | 750 | ------ | ------ | 750 | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Ohio | [24] 43,450 | 203 | 43,653 | 188 | ------ | 18,062 | ------ | ------ | ------ | ------ | ------ | 18,062 | 7,882 | [25] 6,376 | ------ | 14,258 | ------ | ------ | ------ | ------ | 11,145 | ------ | 11,145 |
| Oklahoma | 13,216 | −62 | 13,154 | 264 | ------ | 5,777 | ------ | ------ | ------ | ------ | ------ | 5,777 | *3,231 | ------ | ------ | 3,231 | ------ | 5 | ------ | ------ | ------ | [26] 3,877 | 3,882 |
| Oregon | 9,218 | −69 | 9,149 | 34 | ------ | 4,523 | 203 | 2,976 | ------ | ------ | 2,976 | 7,702 | *1,179 | ------ | ------ | 1,179 | 59 | ------ | 175 | ------ | ------ | ------ | 175 |
| Pennsylvania | 49,383 | [27] −4,646 | 44,737 | 257 | ------ | 21,147 | 862 | 2,807 | ------ | ------ | 2,807 | 24,816 | *6,021 | 1,192 | ------ | 7,213 | 62 | ------ | ------ | 12,219 | ------ | [28] 170 | 12,389 |
| Rhode Island | 2,230 | 1 | 2,231 | 14 | ------ | 1,095 | 77 | 132 | ------ | ------ | 132 | 1,304 | ------ | ------ | ------ | ------ | 13 | ------ | 607 | 293 | ------ | ------ | 900 |
| South Carolina | 9,695 | −9 | 9,686 | [29] 41 | [29] 12 | 1,902 | ------ | 1,037 | 4,968 | ------ | 6,005 | 7,907 | *1,579 | ------ | ------ | 1,579 | ------ | 147 | ------ | ------ | ------ | ------ | 147 |
| South Dakota | 4,186 | −3 | 4,183 | 47 | 118 | 1,833 | ------ | ------ | ------ | ------ | ------ | 1,833 | ------ | ------ | ------ | ------ | 54 | ------ | ------ | ------ | ------ | [30] 2,131 | 2,131 |
| Tennessee | 18,158 | −93 | 18,065 | 181 | 93 | 2,046 | ------ | 4,928 | 2,372 | ------ | 7,300 | 9,346 | 4,842 | ------ | ------ | 4,842 | ------ | 938 | ------ | ------ | ------ | [31] 2,665 | 3,603 |
| Texas | 38,471 | −691 | 37,780 | 552 | ------ | 18,614 | ------ | ------ | 9,307 | ------ | 9,307 | 27,921 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 9,307 | ------ | 9,307 |
| Utah | 3,088 | −26 | 3,062 | 7 | 4 | 2,908 | 143 | ------ | ------ | ------ | ------ | 3,051 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Vermont | 2,277 | −117 | 2,160 | 3 | ------ | 1,159 | ------ | 333 | ------ | ------ | 333 | 1,492 | 665 | ------ | ------ | 665 | ------ | ------ | ------ | ------ | ------ | [33] 4 | 4 |
| Virginia | 14,714 | ------ | 14,714 | [23] | 29 | 7,972 | ------ | ------ | 552 | ------ | 552 | 8,524 | [32] 6,157 | ------ | ------ | 6,157 | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Washington | 14,345 | 2 | 14,347 | 24 | ------ | 3,722 | ------ | [34] 112 | ------ | ------ | 112 | 3,834 | *7,812 | 1,644 | [34] 91 | 9,547 | ------ | ------ | ------ | [34] 942 | ------ | ------ | 942 |
| West Virginia | 6,810 | ------ | 6,810 | 12 | ------ | 1,769 | ------ | 5,029 | ------ | ------ | 5,029 | 6,798 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Wisconsin | 18,028 | −1,156 | 16,872 | 63 | 197 | 6,784 | ------ | ------ | 2,382 | ------ | 2,382 | 9,166 | 4,465 | 753 | ------ | 5,218 | 86 | ------ | [35] 2,142 | ------ | ------ | ------ | 2,142 |
| Wyoming | 2,254 | −32 | 2,222 | 12 | ------ | 1,507 | 36 | 112 | ------ | ------ | 112 | 1,655 | 555 | ------ | ------ | 555 | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| District of Columbia | 2,393 | −1 | 2,392 | [36] | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 2,382 | ------ | 2,382 | ------ | 10 | ------ | ------ | ------ | ------ | 10 |
| Total | 691,420 | −8,346 | 683,074 | 4,712 | 1,515 | 288,155 | 3,537 | 64,711 | 32,428 | 294 | 97,433 | 389,125 | 131,205 | 28,770 | 7,280 | 167,255 | 1,059 | 2,750 | 49,081 | 28,865 | 28,291 | 10,421 | 119,408 |

[1] Amounts distributed during the calendar year differ in many cases from actual collections because of undistributed balances and lag between accounts of collecting and expending agencies. Adjustments also include deduction of proceeds of tax on gasoline used in aviation in Idaho, Michigan, Nebraska, Oregon, South Carolina, and Wyoming.

[2] In many States the proceeds of motor-fuel taxes, motor-vehicle fees, and motor-carrier taxes are placed in a common fund from which the distribution is made. In these cases the amounts distributed have been prorated in proportion to the receipts, not otherwise dedicated, from these 3 sources of revenue. See tables pages 140 to 143.

[3] Where reported separately from collection expenses, funds allotted for motor-fuel inspection, administration of motor vehicle department, and regulation of motor vehicles, are shown in this column.

[4] Includes funds allotted for expenditure on urban extensions of State highway system, where reported separately from other funds distributed for local roads and streets.

[5] County or local obligations assumed by State as reimbursement for local roads added to State system.

[6] In States indicated by star (*) law provides that allotments for work on local roads or streets may also be used for service of local highway obligations, but amounts so used not reported separately.

[7] In a number of States, allotments for local road work may be used on city streets. This column shows allotments which were reported separately. See note 4.

[8] To State general funds unless otherwise noted. Allocations to county or municipal general funds may have been used in part for highways, but such amounts not reported.

[9] As fees for inspection of gasoline, dealers' license fees, and penalties for infractions of the motor-fuel tax law are not ordinarily regarded as highway revenues, the allocation of such funds to general revenue is shown separately from the allocation of regular motor-fuel tax receipts.

[10] For engineering expenses in connection with irrigation.

[11] Funds allotted to counties for use on both State and local roads.

[12] For county roads under State control.

[13] To division of airways.

[14] For harbor improvement.

[15] To Tolchester Ferry Co.

[16] To Metropolitan District Commission.

[17] Service of nonhighway portion of Emergency Public Works loan, $1,271,000; flood relief and other expenditures for relief, $521,000.

[18] Paid out of motor-vehicle revenue, $3,500. See table pages 140 and 141.

[19] Service of highway relief bonds, a State obligation incurred for improvement of local roads.

[20] Service of institutional construction bonds, $486,000; Department of Commerce and Navigation, $90,000.

[21] Appropriations for highway purposes out of State general fund have been credited against payments of motor-fuel tax and motor-vehicle fees to the general fund and prorated in proportion to net receipts not otherwise dedicated.

[22] To State general fund after crediting appropriations for highway purposes, $37,011,000; New York City general fund, $1,546,000.

[23] Included in cost of collecting motor-vehicle revenue. See table pages 140 and 141.

[24] Ohio imposes a 3-cent tax on motor-vehicle fuel and a 1-cent tax on all liquid fuels. The receipts from the 1-cent tax applicable to nonmotor-vehicle fuels (kerosene, fuel oil, etc.) were $689,000. These receipts have been eliminated from the total given, which represents a 4-cent tax on motor-vehicle fuel.

[25] In cities situated on State highways, one-sixth municipal allotment to be used on urban extensions of State system.

[26] For service of general State debt.

[27] In computing adjustment, amounts loaned to general fund for relief purposes in 1935 and 1936, and not yet repaid, have been included in the undistributed balance.

[28] For aircraft landing fields, $121,000; cooperative work other departments, $49,000.

[29] Estimated.

[30] For payments on real estate bonds.

[31] Service of general fund bonds, $2,421,000; Great Smoky Mountain Park bonds, $242,000; aviation projects, $2,000.

[32] For county roads under State control in all but 3 counties, $5,918,000; transferred to remaining 3 counties, $239,000.

[33] For aviation purposes.

[34] Debt service charges on $10,000,000 emergency relief bond issue prorated in proportion to allotments for State highways, local roads, and nonhighway purposes.

[35] To towns, cities, and villages in lieu of personal property tax formerly imposed on motor vehicles.

[36] Paid out of general revenue. Amount not reported.

# DISPOSITION OF STATE MOTOR-VEHICLE RECEIPTS, 1936

[Compiled for calendar year from reports of State authorities]

| State | Net total receipts of calendar year | Adjustments due to undistributed balances, etc.[1] | Net total funds distributed[2] | Expenses of collection and administration[3] | For other administrative purposes[4] | For State highway purposes | | | | | | | For local roads and streets[7] | | | | For other highway purposes (park and forest roads, etc.) | For nonhighway purposes | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Construction, maintenance, and administration[5] | State highway police | Service of State highway obligations | | | | Total for State highway purposes | For work on county and local roads | For work on city streets[8] | Service of local highway obligations | Total | | To general funds[9] | For relief of unemployment or destitution | For education | For other purposes | Total |
| | | | | | | | | State highway bonds | State-assumed local obligations[6] | Notes and other short-term loans | Total | | | | | | | | | | | |
| | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* |
| Alabama | 4,101 | −118 | 3,983 | 419 | ------- | 1,240 | 278 | 1,321 | ------- | ------- | 1,321 | 2,839 | ------- | ------- | ------- | ------- | ------- | [10] 725 | ------- | ------- | ------- | 725 |
| Arizona | 1,028 | 16 | 1,044 | 190 | ------- | 825 | 29 | ------- | ------- | ------- | ------- | 854 | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
| Arkansas | 2,829 | ------- | 2,829 | 80 | ------- | 750 | 87 | 1,157 | 736 | 19 | 1,912 | 2,749 | ------- | ------- | ------- | ------- | ------- | [10] 3,353 | ------- | ------- | ------- | 3,353 |
| California | 21,087 | −1,751 | 19,336 | 2,177 | 913 | 3,283 | 2,159 | 4,052 | ------- | ------- | 4,052 | 9,494 | *3,399 | ------- | ------- | 3,399 | ------- | ------- | ------- | ------- | ------- | ------- |
| Colorado | 2,589 | −58 | 2,531 | 639 | 60 | 888 | 34 | ------- | ------- | ------- | ------- | 922 | [11] 910 | ------- | ------- | 910 | ------- | ------- | ------- | ------- | ------- | ------- |
| Connecticut | 5,957 | 211 | 6,168 | 827 | ------- | 1,620 | 325 | ------- | 137 | ------- | 137 | 2,082 | 3,259 | ------- | ------- | 3,259 | ------- | ------- | ------- | ------- | ------- | ------- |
| Delaware | 1,102 | 39 | 1,141 | 94 | ------- | 587 | 68 | 25 | 185 | ------- | 210 | 865 | [12] 182 | ------- | ------- | 182 | ------- | ------- | ------- | ------- | ------- | ------- |
| Florida | 5,546 | ------- | 5,546 | 416 | 209 | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | 4,921 | ------- | 4,921 | 4,921 |
| Georgia | 1,302 | ------- | 1,302 | 150 | 49 | 868 | ------- | ------- | 235 | ------- | 235 | 1,103 | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
| Idaho | 2,175 | 61 | 2,236 | 60 | ------- | 316 | 48 | ------- | ------- | ------- | ------- | 364 | *1,812 | ------- | ------- | 1,812 | ------- | ------- | ------- | ------- | ------- | ------- |
| Illinois | 19,410 | −130 | 19,280 | 954 | 316 | 6,045 | 1,421 | 8,929 | 63 | ------- | 8,992 | 16,458 | 1,353 | ------- | ------- | 1,353 | ------- | 199 | ------- | ------- | ------- | 199 |
| Indiana | 9,044 | 66 | 9,110 | 863 | ------- | 3,180 | 338 | ------- | ------- | ------- | ------- | 3,518 | 1,409 | 352 | ------- | 1,761 | ------- | 2,968 | ------- | ------- | ------- | 2,968 |
| Iowa | 10,793 | −16 | 10,777 | 813 | ------- | 5,145 | ------- | ------- | 4,819 | ------- | 4,819 | 9,964 | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
| Kansas | 3,815 | ------- | 3,815 | 285 | ------- | 2,302 | 5 | ------- | 266 | ------- | 266 | 2,573 | 957 | ------- | ------- | 957 | ------- | ------- | ------- | ------- | ------- | ------- |
| Kentucky | 4,591 | 24 | 4,615 | 411 | 24 | 2,807 | 17 | ------- | ------- | ------- | ------- | 2,824 | 557 | ------- | ------- | 557 | ------- | 799 | ------- | ------- | ------- | 799 |
| Louisiana | 4,112 | 125 | 4,237 | 129 | ------- | 2,797 | 404 | 687 | ------- | 220 | 907 | 4,108 | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
| Maine | 3,582 | 44 | 3,626 | 117 | 9 | 2,118 | 100 | 942 | ------- | ------- | 942 | 3,160 | 340 | ------- | ------- | 340 | ------- | ------- | ------- | ------- | ------- | ------- |
| Maryland | 4,744 | −2,311 | 2,433 | 345 | 42 | 342 | 322 | 584 | ------- | ------- | 584 | 1,248 | ------- | 274 | ------- | 274 | ------- | ------- | 524 | ------- | ------- | 524 |
| Massachusetts | 6,795 | 217 | 7,012 | 1,489 | 35 | 2,756 | 95 | 490 | ------- | ------- | 490 | 3,341 | 1,071 | ------- | 131 | 1,202 | [13] 279 | ------- | [14] 666 | ------- | ------- | 666 |
| Michigan | 19,737 | −406 | 19,331 | 1,067 | ------- | ------- | 250 | ------- | ------- | ------- | ------- | 250 | *17,677 | ------- | ------- | 17,677 | ------- | 337 | ------- | ------- | ------- | 337 |
| Minnesota | 8,189 | 41 | 8,230 | 406 | 1,802 | 1,818 | 41 | 2,228 | 1,824 | ------- | 4,052 | 5,911 | ------- | ------- | ------- | ------- | ------- | 111 | ------- | ------- | ------- | 111 |
| Mississippi | 1,869 | ------- | 1,869 | 96 | ------- | 187 | ------- | ------- | ------- | 16 | 16 | 203 | *1,570 | ------- | ------- | 1,570 | ------- | ------- | ------- | ------- | ------- | ------- |
| Missouri | 8,988 | 42 | 9,030 | 500 | ------- | 5,261 | 114 | 3,155 | ------- | ------- | 3,155 | 8,530 | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
| Montana | 1,730 | −96 | 1,634 | 74 | ------- | ------- | 102 | ------- | ------- | ------- | ------- | 102 | 1,427 | 31 | ------- | 1,458 | ------- | ------- | ------- | ------- | ------- | ------- |
| Nebraska | 2,158 | 32 | 2,190 | 86 | ------- | 618 | 37 | ------- | ------- | ------- | ------- | 655 | 1,449 | ------- | ------- | 1,449 | ------- | ------- | ------- | ------- | ------- | ------- |
| Nevada | 279 | ------- | 279 | 18 | ------- | 168 | 3 | 90 | ------- | ------- | 90 | 261 | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
| New Hampshire | 2,635 | 14 | 2,649 | 140 | 3 | 2,080 | 150 | 4 | ------- | ------- | 4 | 2,234 | 132 | ------- | [15] 140 | 272 | ------- | ------- | ------- | ------- | ------- | ------- |
| New Jersey | 17,851 | 4,600 | 22,451 | 1,107 | ------- | 7,575 | ------- | ------- | ------- | ------- | ------- | 7,575 | 6,445 | ------- | 1,273 | 7,718 | 61 | ------- | 5,990 | ------- | ------- | 5,990 |
| New Mexico | 1,318 | 94 | 1,412 | 213 | ------- | 539 | ------- | ------- | ------- | ------- | ------- | 539 | 180 | ------- | ------- | 180 | ------- | [16] 480 | ------- | ------- | ------- | 480 |
| New York[17] | 46,291 | −347 | 45,944 | 2,473 | 93 | 7,173 | 775 | 5,012 | ------- | ------- | 5,012 | 12,960 | *9,185 | ------- | ------- | 9,185 | ------- | [18] 21,233 | ------- | ------- | ------- | 21,233 |
| North Carolina | 7,589 | −209 | 7,380 | 398 | ------- | 1,736 | 71 | 2,318 | 142 | ------- | 2,460 | 4,267 | [12] 2,329 | ------- | ------- | 2,329 | ------- | 386 | ------- | ------- | ------- | 386 |
| North Dakota | 1,456 | 359 | 1,815 | 95 | 20 | 827 | 21 | ------- | ------- | ------- | ------- | 848 | 847 | ------- | ------- | 847 | ------- | ------- | ------- | [19] 5 | ------- | 5 |
| Ohio | 23,256 | 862 | 24,118 | 807 | ------- | 5,359 | 560 | ------- | ------- | ------- | ------- | 5,919 | *17,067 | ------- | ------- | 17,067 | ------- | ------- | ------- | [20] 325 | ------- | 325 |
| Oklahoma | 4,743 | 60 | 4,803 | 713 | 305 | 1,550 | ------- | ------- | ------- | ------- | ------- | 1,550 | *2,235 | ------- | ------- | 2,235 | ------- | ------- | ------- | ------- | ------- | ------- |
| Oregon | 2,832 | −37 | 2,795 | 331 | ------- | 1,222 | 55 | 804 | ------- | ------- | 804 | 2,081 | *319 | ------- | ------- | 319 | 16 | 48 | ------- | ------- | ------- | 48 |
| Pennsylvania | 35,331 | [21] −87 | 35,244 | 1,618 | ------- | 27,099 | 1,105 | 3,597 | ------- | ------- | 3,597 | 31,801 | ------- | 1,527 | ------- | 1,527 | 80 | ------- | ------- | ------- | [22] 218 | 218 |
| Rhode Island | 2,596 | 372 | 2,968 | 271 | ------- | 1,332 | 93 | 161 | ------- | ------- | 161 | 1,586 | ------- | ------- | ------- | ------- | 16 | 738 | 357 | ------- | ------- | 1,095 |
| South Carolina | 1,876 | 57 | 1,933 | 216 | ------- | 376 | 155 | 205 | 981 | ------- | 1,186 | 1,717 | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
| South Dakota | 1,540 | 18 | 1,558 | 61 | 27 | 304 | ------- | ------- | ------- | ------- | ------- | 304 | 1,157 | ------- | ------- | 1,157 | 9 | ------- | ------- | ------- | ------- | ------- |
| Tennessee | 3,706 | 1 | 3,707 | 195 | ------- | 3,236 | 209 | 67 | ------- | ------- | 67 | 3,512 | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
| Texas | 17,725 | −1 | 17,724 | 937 | 305 | 5,273 | 316 | ------- | ------- | ------- | ------- | 5,589 | *10,893 | ------- | ------- | 10,893 | ------- | ------- | ------- | ------- | ------- | ------- |
| Utah | 976 | −48 | 928 | 135 | 11 | ------- | ------- | 737 | ------- | ------- | 737 | 737 | ------- | ------- | ------- | ------- | ------- | 45 | ------- | ------- | ------- | 45 |
| Vermont | 2,245 | −108 | 2,137 | 58 | ------- | 1,071 | 86 | 307 | ------- | ------- | 307 | 1,464 | 615 | ------- | ------- | 615 | ------- | ------- | ------- | ------- | ------- | ------- |
| Virginia | 5,737 | 17 | 5,754 | 401 | ------- | 4,814 | 205 | ------- | 334 | ------- | 334 | 5,353 | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
| Washington | 2,980 | 139 | 3,119 | 318 | ------- | 2,658 | 120 | ------- | ------- | ------- | ------- | 2,778 | 24 | ------- | ------- | 23 | ------- | ------- | ------- | ------- | ------- | ------- |
| West Virginia | 5,832 | ------- | 5,832 | 189 | ------- | 1,249 | 24 | 3,551 | ------- | ------- | 3,551 | 4,824 | [12] 819 | ------- | ------- | 819 | ------- | ------- | ------- | ------- | ------- | ------- |
| Wisconsin | 12,213 | 33 | 12,246 | 727 | 164 | 4,637 | ------- | ------- | 1,628 | ------- | 1,628 | 6,265 | 3,052 | 514 | ------- | 3,566 | 59 | [23] 1,465 | ------- | ------- | ------- | 1,465 |
| Wyoming | 541 | 14 | 555 | 12 | ------- | 369 | 8 | 166 | ------- | ------- | 166 | 543 | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
| District of Columbia | 963 | −109 | 854 | 95 | 49 | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | [24] 710 | ------- | ------- | ------- | 710 |
| Total | 359,784 | 1,726 | 361,510 | 24,215 | 4,436 | 126,400 | 10,230 | 40,589 | 11,350 | 255 | 52,194 | 188,824 | 92,670 | 2,698 | 1,544 | 96,912 | 520 | 33,597 | 7,537 | 4,921 | 548 | 46,603 |

[1] Amounts distributed during the calendar year differ

[1] Amounts distributed during the calendar year differ in many cases from actual collections because of undistributed balances and lag between accounts of collecting and expending agencies.

[2] In many States the proceeds of motor-fuel taxes, motor-vehicle fees, and motor-carrier taxes are placed in a common fund from which the distribution is made. In these cases the amounts distributed have been prorated in proportion to the receipts, not otherwise dedicated, from these 3 sources of revenue. See tables pp. 138–139 and 142–143.

[3] Collection expenses in many States include service charges deducted by county and local collectors.

[4] Where reported separately from collection expenses, funds allotted for collection of motor-fuel tax, payments to auto-theft fund, and miscellaneous expenses of motor-vehicle regulation, are shown in this column.

[5] Includes funds allotted for expenditure on urban extensions of State highway system, where reported separately from other funds distributed for local roads and streets.

[6] County or local obligations assumed by State as reimbursement for local roads added to State system.

[7] In States indicated by star (*) law provides that allotments for work on local roads or streets may also be used for service of local highway obligations, but amounts so used not reported separately.

[8] In a number of States allotments for local road work may be used on city streets. This column shows allotments which were reported separately. See note 5.

[9] To State general funds unless otherwise noted. Allocations to county or municipal general funds may have been used in part for highways, but such amounts not reported.

[10] To county and municipal general funds.

[11] Funds allotted to counties for use on both State and local roads.

[12] For county roads under State control.

[13] To metropolitan district commission.

[14] Service of nonhighway portion of Emergency Public Works loan, $473,000; flood relief and other expenditures for relief, $193,000.

[15] Service of highway relief bonds, a State obligation incurred for improvement of local roads.

[16] To State general fund, $180,000; county general funds, $300,000.

[17] Appropriations for highway purposes out of State general fund have been credited against payments of motor-fuel tax and motor-vehicle fees to the general fund and prorated in proportion to net receipts not otherwise dedicated.

[18] To State general fund after crediting appropriations for highway purposes, $16,788,000; New York City general fund, $4,445,000.

[19] To Bureau of Criminal Identification.

[20] Hospitalization of indigent persons injured in motor-vehicle accidents.

[21] In computing adjustment, amounts loaned to general fund for relief purposes in 1935 and 1936, and not yet repaid, have been included in the undistributed balances.

[22] For aircraft landing fields, $156,000; cooperative work other departments, $62,000.

[23] To towns, cities, and villages in lieu of personal property tax formerly imposed on motor vehicles.

[24] To District of Columbia general fund.

# DISPOSITION OF STATE MOTOR-CARRIER TAX RECEIPTS, 1936

[Compiled for calendar year from reports of State authorities]

| State | Net total receipts of calendar year | Adjustments due to undistributed balances, etc.[1] | Net total funds distributed [2] | Expenses of collection and administration | For State highway purposes | | | | | | For local roads and streets [5] | | | For other highway purposes (park and forest roads, etc.) | For nonhighway purposes | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Construction, maintenance, and administration [3] | State highway police | Service of State highway obligations | | | Total for State highway purposes | For work on county and local roads | Service of local highway obligations | Total | | To general funds [6] | For relief of unemployment or destitution | For education | Total |
| | | | | | | | State highway bonds | State-assumed local obligations [4] | Total | | | | | | | | | |
| | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* |
| Alabama | 187 | −17 | 170 | 42 | 128 | | | | | 128 | | | | | | | | |
| Arizona | 150 | | 150 | 9 | 136 | 5 | | | | 141 | | | | | | | | |
| Arkansas | 3 | | 3 | | 1 | | 1 | 1 | 2 | 3 | | | | | | | | |
| California | 2,742 | −90 | 2,652 | 564 | 7 | | | | | 7 | 7 | | 7 | | 2,074 | | | 2,074 |
| Colorado | 568 | −59 | 509 | 88 | 251 | 10 | | | | 261 | [7] 160 | | 160 | | | | | |
| Connecticut | 290 | −107 | 183 | | 55 | | | 5 | 5 | 60 | | | | | [8] 123 | | | 123 |
| Delaware | (9) | | | | | | | | | | | | | | | | | |
| Florida | 263 | | 263 | 46 | | | | | | | | 204 | 204 | | [8] 8 | | 5 | 13 |
| Georgia | 400 | −165 | 235 | 135 | 79 | | | 21 | 21 | 100 | | | | | | | | |
| Idaho | 122 | −8 | 114 | 39 | 49 | 26 | | | | 75 | | | | | | | | |
| Illinois | (9) | | | | | | | | | | | | | | | | | |
| Indiana | 641 | −73 | 568 | 132 | 436 | | | | | 436 | | | | | | | | |
| Iowa | 500 | | 500 | 152 | | | | | | | *348 | | 348 | | | | | |
| Kansas | 1,079 | | 1,079 | 268 | 460 | 107 | | 53 | 53 | 620 | 191 | | 191 | | | | | |
| Kentucky | 309 | −41 | 268 | 39 | 227 | 1 | | | | 228 | 1 | | 1 | | | | | |
| Louisiana | 4 | | 4 | 4 | | | | | | | | | | | | | | |
| Maine | 23 | | 23 | 23 | | | | | | | | | | | | | | |
| Maryland | (10) | | | | | | | | | | | | | | | | | |
| Massachusetts | 84 | | 84 | 66 | | | | | | | | | | | 18 | | | 18 |
| Michigan | 481 | −119 | 362 | 106 | 256 | | | | | 256 | | | | | | | | |
| Minnesota | 19 | | 19 | 19 | | | | | | | | | | | | | | |
| Mississippi | 100 | 5 | 105 | 2 | | | | | | | *103 | | 103 | | | | | |
| Missouri | 551 | −470 | 81 | 81 | | | | | | | | | | | | | | |
| Montana | 37 | −4 | 33 | 33 | | | | | | | | | | | | | | |
| Nebraska | (9) | | | | | | | | | | | | | | | | | |
| Nevada | 199 | 1 | 200 | 12 | 185 | 3 | | | | 188 | | | | | | | | |
| New Hampshire | 3 | | 3 | 3 | | | | | | | | | | | | | | |
| New Jersey | 79 | 36 | 115 | | 46 | | | | | 46 | 25 | 7 | 32 | 1 | | 36 | | 36 |
| New Mexico | 149 | 3 | 152 | 11 | 128 | 13 | | | | 141 | | | | | | | | |
| New York | (9) | | | | | | | | | | | | | | | | | |
| North Carolina | 175 | | 175 | | 43 | 2 | 58 | 4 | 62 | 107 | [11] 58 | | 58 | | 10 | | | 10 |
| North Dakota | 49 | −13 | 36 | 36 | | | | | | | | | | | | | | |
| Ohio | 728 | −344 | 384 | 128 | 133 | | | | | 133 | 123 | | 123 | | | | | |
| Oklahoma | 1,004 | −21 | 983 | 49 | 934 | | | | | 934 | | | | | | | | |
| Oregon | 1,012 | −37 | 975 | 173 | 392 | 30 | 258 | | 258 | 680 | *102 | | 102 | 5 | 15 | | | 15 |
| Pennsylvania | 5 | | 5 | | 5 | | | | | 5 | | | | | | | | |
| Rhode Island | 11 | | 11 | 10 | 1 | | | | | 1 | | | | | | | | |
| South Carolina | 126 | −32 | 94 | 22 | 65 | | | | | 65 | | | | | [12] 7 | | | 7 |
| South Dakota | 479 | 14 | 493 | 48 | 433 | | | | | 433 | | | | 12 | | | | |
| Tennessee | 323 | −5 | 318 | 56 | 202 | | 9 | | 9 | 211 | | | | | 51 | | | 51 |
| Texas | 82 | | 82 | 72 | 10 | | | | | 10 | | | | | | | | |
| Utah | 205 | −109 | 96 | 21 | 75 | | | | | 75 | | | | | | | | |
| Vermont | (9) | | | | | | | | | | | | | | | | | |
| Virginia | 155 | | 155 | 22 | 100 | | | 7 | 7 | 107 | | | | | 26 | | | 26 |
| Washington | 197 | | 197 | 197 | | | | | | | | | | | | | | |
| West Virginia | 72 | | 72 | | 19 | | 53 | | 53 | 72 | | | | | | | | |
| Wisconsin | 1,144 | −70 | 1,074 | 326 | | | | | | | | | | | 748 | | | 748 |
| Wyoming | 174 | | 174 | 30 | 141 | 3 | | | | 144 | | | | | | | | |
| District of Columbia | 213 | −1 | 212 | | | | | | | | | | | | [13] 212 | | | 212 |
| Total | 15,137 | −1,726 | 13,411 | 3,064 | 4,997 | 200 | 379 | 91 | 470 | 5,667 | 1,118 | 211 | 1,329 | 18 | 3,292 | 36 | 5 | 3,333 |

[1] Amounts distributed during the calendar

[1] Amounts distributed during the calendar year differ in many cases from actual collections because of undistributed balances and lag between accounts of collecting and expending agencies.

[2] In many States the proceeds of motor-fuel taxes, motor-vehicle fees, and motor-carrier taxes are placed in a common fund from which the distribution is made. In these cases the amounts distributed have been prorated in proportion to the receipts, not otherwise dedicated, from these 3 sources of revenue. See tables pp. 138 to 141.

[3] Includes funds allotted for expenditure on urban extensions of State highway system, where reported separately from other funds distributed for local roads and streets.

[4] County or local obligations assumed by State as reimbursement for local roads added to State system.

[5] In States indicated by star (*) law provides that allotments for work on local roads or streets may also be used for service of local highway obligations, but amounts so used not reported separately.

[6] To State general funds unless otherwise noted. Allocations to county or municipal general funds may have been used in part for highways, but such amounts not reported.

[7] Funds allotted to counties for use on both State and local roads.

[8] To cities and towns.

[9] No special taxes on motor carriers reported.

[10] Ton-mile and passenger-mile taxes paid by motor carriers in lieu of registration fees included in motor-vehicle receipts, table pp. 140 and 141.

[11] For county roads under State control.

[12] To cities.

[13] To District of Columbia general fund.

# DISPOSITION OF RECEIPTS FROM STATE IMPOSTS ON HIGHWAY USERS, 1936

[Compiled for calendar year from reports of State authorities]

| State | Net total receipts of calendar year [1] | Adjustments due to undistributed balances, etc.[2] | Net total funds distributed | Expenses of collection and administration [3] | For State highway purposes | | | | | | For local roads and streets [6] | | | | For other highway purposes (park and forest roads, etc.) | For nonhighway purposes | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Construction, maintenance, and administration [4] | State highway police | Service of State highway obligations | | | Total for State highway purposes | For work on county and local roads | For work on city streets [7] | Service of local highway obligations | Total | | To general funds [5] | | For relief of unemployment or destitution | For education | For other purposes | Total |
| | | | | | | | State highway bonds | State assumed local obligations [8] | Notes and other short-term loans | Total | | | | | | Motor-fuel (inspection fees, dealers' licenses, etc.) [9] | All other highway user imposts | | | | |
| | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* | *1,000 dollars* |
| Alabama | 16,091 | −213 | 15,878 | 561 | 5,742 | 278 | 2,829 | | | 2,829 | 8,849 | 5,743 | | | 5,743 | | [10] 725 | | | 725 |
| Arizona | 5,021 | 16 | 5,037 | 262 | 3,494 | 125 | | | | | 3,619 | *1,149 | | | 1,149 | | | | [11] 7 | 7 |
| Arkansas | 12,067 | −23 | 12,044 | 424 | 3,043 | 87 | 4,694 | 2,986 | 77 | 7,757 | 10,887 | 572 | | 84 | 656 | 77 | | | | 77 |
| California | 66,837 | −1,511 | 65,326 | 3,793 | 31,837 | 2,159 | 4,052 | | | 4,052 | 38,048 | *14,119 | 3,939 | | 18,058 | | [12] 5,427 | | | 5,427 |
| Colorado | 9,990 | −127 | 9,863 | 890 | 5,872 | 223 | | | | | 6,095 | [13] 2,878 | | | 2,878 | | | | | |
| Connecticut | 15,082 | −78 | 15,004 | 878 | 9,605 | 325 | | 814 | | 814 | 10,744 | 3,259 | | | 3,259 | | [14] 123 | | | 123 |
| Delaware | 2,958 | 39 | 2,997 | 106 | 1,622 | 187 | 70 | 510 | | 580 | 2,389 | [15] 502 | | | 502 | | | | | |
| Florida | 26,126 | −15 | 26,111 | 1,048 | 8,360 | 146 | | 2,846 | | 2,846 | 11,352 | 12 | | 5,897 | 5,909 | | [16] 2,854 | | 4,926 | [17] 22 | 7,802 |
| Georgia | 19,195 | −165 | 19,030 | 856 | 9,800 | | | 2,659 | | 2,659 | 12,459 | 2,814 | | | 2,814 | | | | 2,901 | | 2,901 |
| Idaho | 5,993 | 41 | 6,034 | 112 | 4,036 | 74 | | | | | 4,110 | *1,812 | | | 1,812 | | | | | | |
| Illinois | 53,229 | −123 | 53,106 | 1,706 | 17,142 | 1,421 | 8,929 | 63 | | 8,992 | 27,555 | *9,011 | *7,422 | | 16,433 | | | | | | |
| Indiana | 30,839 | −2,864 | 27,975 | 1,149 | 11,065 | 338 | | | | | 11,403 | 9,654 | 2,413 | | 12,067 | 99 | 199 | 4,417 | 2,697 | | 7,412 |
| Iowa | 23,489 | −11 | 23,478 | 1,066 | 8,615 | | | 8,069 | | 8,069 | 16,684 | *5,728 | | | 5,728 | 388 | 2,968 | | | | 3,356 |
| Kansas | 14,414 | −61 | 14,353 | 969 | 8,660 | 124 | | 1,000 | | 1,000 | 9,784 | 3,600 | | | 3,600 | | | | | | |
| Kentucky | 16,177 | 236 | 16,413 | 509 | 14,436 | 67 | | | | | 14,503 | 602 | | | 602 | | 799 | | | | 799 |
| Louisiana | 16,323 | −814 | 15,509 | 227 | 2,797 | 404 | 8,374 | | 220 | 8,594 | 11,795 | | | | | | | 1,576 | 956 | [18] 955 | 3,487 |
| Maine | 8,807 | 101 | 8,908 | 165 | 5,290 | 250 | 2,353 | | | 2,353 | 7,893 | 850 | | | 850 | | | | | | |
| Maryland | 13,665 | −2,311 | 11,354 | 421 | 3,449 | 322 | 2,118 | | | 2,118 | 5,889 | 993 | 2,941 | 572 | 4,506 | | | 524 | | [19] 14 | 538 |
| Massachusetts | 25,327 | 232 | 25,559 | 1,640 | 10,170 | 350 | 1,809 | | | 1,809 | 12,329 | 3,950 | | 484 | 4,434 | [20] 1,030 | | | | | |
| Michigan | 45,957 | −666 | 45,291 | 1,314 | 15,438 | 250 | 3,720 | | | 3,720 | 19,408 | *24,227 | | | 24,227 | | 3,668 | [21] 2,458 | | | 6,126 |
| Minnesota | 20,537 | −44 | 20,493 | 2,340 | 10,253 | 233 | 2,228 | 1,824 | | 4,052 | 14,538 | *3,421 | | | 3,421 | 5 | 337 | | | | 342 |
| Mississippi | 11,031 | −223 | 10,808 | 229 | 3,092 | 30 | 1,761 | | 252 | 2,013 | 5,135 | *5,426 | | | 5,426 | 83 | 111 | | | | 194 |
| Missouri | 20,727 | −428 | 20,299 | 686 | 12,055 | 262 | 7,230 | | | 7,230 | 19,547 | | | | | 18 | | | | | |
| Montana | 6,222 | −249 | 5,973 | 129 | 4,150 | 102 | 134 | | | 134 | 4,386 | 1,427 | 31 | | 1,458 | | | | | | |
| Nebraska | 13,478 | 2 | 13,480 | 188 | 6,212 | 37 | | | | | 6,249 | *4,471 | 334 | | 4,805 | 66 | | | | | 66 |
| Nevada | 1,558 | 1 | 1,559 | 33 | 1,397 | 25 | 90 | 14 | | 104 | 1,526 | | | | | | | | | | |
| New Hampshire | 5,819 | 13 | 5,832 | 146 | 4,185 | 150 | 804 | | | 804 | 5,139 | 265 | | [22] 282 | 547 | | | 2,238 | | | 2,238 |
| New Jersey | 37,036 | 6,068 | 43,104 | 1,228 | 9,672 | | 7,636 | | | 7,636 | 17,308 | 9,590 | | 1,625 | 11,215 | 78 | | | | | |
| New Mexico | 4,877 | 72 | 4,949 | 299 | 2,413 | 13 | 1,564 | | | 1,564 | 3,990 | 180 | | | 180 | | [24] 480 | 11,414 | 1,285 | [23] 576 | 13,275 |
| New York [25] | 102,000 | 713 | 102,713 | 2,657 | 12,717 | 1,374 | 8,886 | | | 8,886 | 22,977 | *17,289 | | | 17,289 | | [26]59,790 | | | | 480 |
| North Carolina | 28,725 | −209 | 28,516 | 428 | 6,751 | 276 | 9,017 | 553 | | 9,570 | 16,597 | [13] 9,059 | | | 9,059 | 932 | 1,500 | | | | 59,790 |
| North Dakota | 3,806 | 376 | 4,182 | 232 | 2,303 | 45 | | | | | 2,348 | 1,597 | | | 1,597 | | | | | [27] 5 | 2,432 |
| Ohio | 67,434 | 721 | 68,155 | 1,123 | 23,554 | 560 | | | | | 24,114 | *25,072 | 6,376 | | 31,448 | | | | 11,145 | [28] 325 | 5 |
| Oklahoma | 18,963 | −23 | 18,940 | 1,331 | 8,261 | | | | | | 8,261 | *5,466 | | | 5,466 | 5 | | | | [29] 3,877 | 11,470 |
| Oregon | 13,062 | −143 | 12,919 | 538 | 6,137 | 288 | 4,038 | | | 4,038 | 10,463 | *1,600 | | | 1,600 | 89 | 238 | | | | 3,882 |
| Pennsylvania | 84,719 | [30] −4,733 | 79,986 | 1,875 | 48,251 | 1,967 | 6,404 | | | 6,404 | 56,622 | *6,021 | 2,719 | | 8,740 | 142 | | 12,219 | | | 238 |
| Rhode Island | 4,837 | 373 | 5,210 | 295 | 2,428 | 170 | 293 | | | 293 | 2,891 | | | | | 29 | [32] 1,345 | 650 | | [31] 388 | 12,607 |
| South Carolina | 11,697 | 16 | 11,713 | 291 | 2,343 | 155 | 1,242 | 5,949 | | 7,191 | 9,689 | *1,579 | | | 1,579 | | | | | | 1,995 |
| South Dakota | 6,205 | 29 | 6,234 | 301 | 2,570 | | | | | | 2,570 | 1,157 | | | 1,157 | 75 | 7 | | | | 154 |
| Tennessee | 22,187 | −97 | 22,090 | 525 | 5,484 | 209 | 5,004 | 2,372 | | 7,376 | 13,069 | 4,842 | | | 4,842 | | | | | [31] 2,131 | 2,131 |
| Texas | 56,278 | −692 | 55,586 | 1,866 | 23,897 | 316 | | 9,307 | | 9,307 | 33,520 | *10,893 | | | 10,893 | 147 | 7 | | | [34] 2,665 | 3,654 |
| Utah | 4,269 | −183 | 4,086 | 178 | 2,983 | 143 | 737 | | | 737 | 3,863 | | | | | 938 | 51 | | | | 9,307 |
| Vermont | 4,522 | −225 | 4,297 | 61 | 2,230 | 86 | 640 | | | 640 | 2,956 | 1,280 | | | 1,280 | | | | 9,307 | | |
| Virginia | 20,606 | 17 | 20,623 | 452 | 12,886 | 205 | | 893 | | 893 | 13,984 | [35] 6,157 | | | 6,157 | | 45 | | | | 45 |
| Washington | 17,522 | 141 | 17,663 | 539 | 6,380 | 120 | [37] 112 | | | 112 | 6,612 | *7,835 | 1,644 | [37] 91 | 9,570 | | 26 | | | [36] 4 | 30 |
| West Virginia | 12,714 | | 12,714 | 201 | 3,037 | 24 | 8,633 | | | 8,633 | 11,694 | [13] 819 | | | 819 | | | [37] 942 | | | 942 |
| Wisconsin | 31,385 | −1,193 | 30,192 | 1,477 | 11,421 | | | 4,010 | | 4,010 | 15,431 | 7,517 | 1,267 | | 8,784 | 145 | [38] 4,355 | | | | 4,355 |
| Wyoming | 2,969 | −18 | 2,951 | 54 | 2,017 | 47 | 278 | | | 278 | 2,342 | 555 | | | 555 | | | | | | |
| District of Columbia | 3,569 | −111 | 3,458 | 144 | | | | | | | | | 2,382 | | 2,382 | | 10 [39] 922 | | | | 932 |
| Total | 1,066,341 | −8,346 | 1,057,995 | 37,942 | 419,552 | 13,967 | 105,679 | 43,869 | 549 | 150,097 | 583,616 | 224,993 | 31,468 | 9,035 | 265,496 | 1,597 | 2,750 | 85,970 | 36,438 | 33,217 | 10,969 | 169,344 |

[1] Includes receipts from (1) motor-fuel taxes, (2) motor-vehicle fees and fines, and (3) special imposts on motor vehicles operated for hire (motor-carrier taxes). See tables, pp. 138 to 143, which give distribution of these 3 classes of receipts separately.

[2] Amounts distributed during the calendar year differ in many cases from actual collections because of undistributed balances and lag between accounts of collecting and expending agencies. Adjustments also include deduction of proceeds of tax on gasoline used in aviation in Idaho, Michigan, Nebraska, Oregon, South Carolina, and Wyoming.

[3] Includes expenses of collection and administration of motor-fuel tax, motor-vehicle fees, and motor-carrier taxes, and miscellaneous expenses of motor-vehicle regulation.

[4] Includes funds allotted for expenditure on urban extensions of State highway system, where reported separately from other funds distributed for local roads and streets.

[5] County or local obligations assumed by State as reimbursement for local roads added to State system.

[6] In States indicated by star (*) law provides that allotments for work on local roads or streets may also be used for service of local highway obligations, but amounts so used not reported separately.

[7] In a number of States allotments for local road work may be used on city streets. This column shows allotments which were reported separately. See note 4.

[8] To State general funds unless otherwise noted. Allocations to county or municipa lgeneral funds may have been used in part for highways, but such amounts not reported.

[9] As fees for inspection of gasoline, dealers' license fees, and penalties for infractions of the motor-fuel tax law are not ordinarily regarded as highway revenues, the allocation of such funds to general revenue is shown separately from the allocation of regular motor-fuel tax receipts.

[10] To county and municipal general funds.

[11] For engineering expenses in connection with irrigation.

[12] To State general fund, $2,074,000; county and municipal general funds, $3,353,000.

[13] Funds alloted to counties for use on both State and local roads.

[14] To cities and towns.

[15] For county roads under State control.

[16] To State general fund, $2,846,000; municipal general funds, $8,000.

[17] To Division of Airways.

[18] For harbor improvement.

[19] To Tolchester Ferry Co.

[20] To Metropolitan District Commission.

[21] Service of nonhighway portion of emergency public works loan, $1,744,000; flood relief and other expenditures for relief, $714,000.

[22] Service of highway relief bonds, a State obligation incurred for improvement of local roads.

[23] Service of institutional construction bonds, $486,000; Department of Commerce and Navigation, $90,000.

[24] To State general fund, $180,000; county general funds, $300,000.

[25] Appropriations for highway purposes out of State general fund have been credited against payments of motor-fuel tax and motor-vehicle fees to the general fund and prorated in proportion to net receipts not otherwise dedicated.

[26] To State general fund after crediting appropriations for highway purposes, $53,799,000; New York City general fund, $5,991,000.

[27] To Bureau of Criminal Identification.

[28] Hospitalization of indigent persons injured in motor-vehicle accidents.

[29] For service of general State debt.

[30] In computing adjustment, $17,556,000 loaned to general fund for relief purposes in 1935 and 1936, and not yet repaid, has been included in the undistributed balance.

[31] For aircraft landing fields, $277,000; cooperative work, other departments, $111,000.

[32] In addition to this amount, $3,675,000, reported as the balance in the general highway fund, Dec. 31, 1935, was reported in 1936 as no longer available for highway purposes. The latter amount represents highway user revenues of prior years, shown in previous tables as allotted for highway purposes.

[33] For payments on real estate bonds.

[34] Service of general fund bonds, $2,421,000; Great Smoky Mountain Park bonds, $242,000; aviation projects, $2,000.

[35] For county roads under State control in all but 3 counties, $5,918,000; transferred to remaining 3 counties, $239,000.

[36] For aviation purposes.

[37] Debt service charges on $10,000,000 emergency relief bond issue prorated in proportion to allotments for State highways, local roads, and nonhighway purposes.

[38] To State general fund, $748,000; towns, cities, and villages in lieu of personal property tax formerly imposed on motor vehicles, $3,607,000.

[39] To District of Columbia general fund.

# STATUS OF FEDERAL-AID HIGHWAY PROJECTS

## AS OF AUGUST 31, 1937

| STATE | COMPLETED DURING CURRENT FISCAL YEAR | | | UNDER CONSTRUCTION | | | APPROVED FOR CONSTRUCTION | | | BALANCE OF FUNDS AVAILABLE FOR NEW PROJECTS |
|---|---|---|---|---|---|---|---|---|---|---|
| | Estimated Total Cost | Federal Aid | Miles | Estimated Total Cost | Federal Aid | Miles | Estimated Total Cost | Federal Aid | Miles | |
| Alabama | | | | $1,639,801 | $819,900 | 68.2 | $3,744,760 | $1,872,375 | 167.6 | $5,154,905 |
| Arizona | $ 694,770 | $ 357,298 | 35.9 | 1,360,811 | 991,685 | 44.4 | 257,877 | 171,071 | 16.3 | 1,764,484 |
| Arkansas | 345,172 | 345,172 | 16.7 | 3,473,291 | 3,467,581 | 232.0 | 263,266 | 262,938 | 10.7 | 2,322,961 |
| California | 3,754,489 | 1,972,143 | 80.7 | 5,974,864 | 3,271,380 | 104.4 | 1,409,454 | 760,009 | 20.8 | 2,840,923 |
| Colorado | 893,459 | 499,933 | 33.0 | 2,619,223 | 1,454,599 | 88.4 | 124,133 | 64,552 | 1.5 | 2,344,136 |
| Connecticut | 362,558 | 179,076 | 2.1 | 579,550 | 281,943 | 7.8 | 82,620 | 41,310 | .2 | 1,508,572 |
| Delaware | | | | 512,312 | 256,067 | 19.5 | 243,905 | 119,934 | 14.8 | 1,107,687 |
| Florida | 134,650 | 67,320 | 6.6 | 2,573,372 | 1,286,686 | 60.9 | 397,670 | 198,835 | 6.5 | 2,858,060 |
| Georgia | 816,859 | 408,430 | 44.0 | 3,889,503 | 1,944,736 | 189.7 | 1,938,066 | 969,033 | 77.8 | 5,340,635 |
| Idaho | 908,435 | 542,083 | 70.5 | 1,482,620 | 885,910 | 83.0 | 655,042 | 390,486 | 68.0 | 1,147,368 |
| Illinois | 1,422,380 | 676,715 | 42.8 | 10,333,417 | 5,146,417 | 314.4 | 4,383,223 | 2,184,900 | 86.4 | 2,892,257 |
| Indiana | 1,709,942 | 854,916 | 36.6 | 5,439,218 | 2,719,604 | 150.4 | 1,331,848 | 665,924 | 26.1 | 2,106,982 |
| Iowa | 795,707 | 387,048 | 25.3 | 6,675,643 | 2,976,765 | 201.0 | 3,382,662 | 1,554,650 | 100.6 | 1,179,284 |
| Kansas | 870,736 | 408,921 | 35.6 | 5,177,422 | 2,573,552 | 223.1 | 1,852,464 | 926,227 | 97.7 | 3,376,996 |
| Kentucky | 447,254 | 223,627 | 10.8 | 3,965,699 | 1,932,850 | 105.6 | 1,366,728 | 683,364 | 83.5 | 2,817,722 |
| Louisiana | 103,036 | 51,219 | 2.5 | 9,357,799 | 1,255,274 | 25.0 | 946,050 | 401,952 | 39.5 | 2,469,714 |
| Maine | 634,170 | 317,085 | 17.6 | 2,224,106 | 1,112,053 | 58.4 | 1,142,830 | 571,415 | 22.9 | 278,204 |
| Maryland | 180,456 | 90,228 | 2.1 | 1,439,650 | 719,792 | 21.7 | 987,818 | 493,909 | 16.8 | 1,790,879 |
| Massachusetts | 10,066 | 5,033 | | 4,924,270 | 2,462,135 | 22.5 | 604,454 | 302,226 | 2.3 | 2,318,938 |
| Michigan | 2,755,300 | 1,377,650 | 76.7 | 6,873,560 | 3,437,280 | 162.8 | 3,787,173 | 1,815,361 | 71.0 | 99,201 |
| Minnesota | 1,053,966 | 526,953 | 57.8 | 5,336,438 | 2,600,130 | 192.8 | 1,324,746 | 447,658 | 50.1 | 2,449,506 |
| Mississippi | 264,600 | 132,300 | 9.6 | 3,998,590 | 1,999,230 | 202.3 | 1,883,000 | 940,850 | 77.6 | 3,560,644 |
| Missouri | 2,605,736 | 1,283,758 | 121.4 | 7,359,634 | 3,611,718 | 338.2 | 3,091,192 | 1,296,098 | 126.8 | 2,586,168 |
| Montana | 1,814,791 | 1,017,339 | 136.4 | 2,505,320 | 1,406,042 | 154.2 | 1,261,915 | 679,449 | 55.2 | 2,326,754 |
| Nebraska | 731,814 | 365,907 | 92.9 | 4,954,444 | 2,496,584 | 493.7 | 1,290,936 | 614,084 | 81.0 | 2,652,067 |
| Nevada | 595,172 | 515,578 | 34.9 | 1,988,379 | 1,712,184 | 84.8 | 105,983 | 91,865 | 1.1 | 1,049,767 |
| New Hampshire | 12,936 | 6,468 | | 589,265 | 290,644 | 8.0 | 256,644 | 126,901 | 5.1 | 1,008,498 |
| New Jersey | | | | 2,476,848 | 1,160,809 | 22.2 | 39,430 | 19,715 | | 2,299,692 |
| New Mexico | 782,661 | 473,854 | 54.1 | 2,633,256 | 1,718,429 | 146.8 | 1,187,054 | 723,913 | 89.4 | 715,430 |
| New York | 2,597,774 | 1,281,576 | 40.6 | 19,792,281 | 9,277,416 | 329.6 | 2,918,310 | 1,432,955 | 46.0 | 1,979,275 |
| North Carolina | 1,334,139 | 667,070 | 101.0 | 4,696,563 | 2,224,582 | 274.0 | 1,670,351 | 761,155 | 69.2 | 3,448,894 |
| North Dakota | 543,890 | 543,890 | 109.0 | 790,120 | 769,610 | 126.2 | 486,842 | 486,842 | 65.1 | 3,921,891 |
| Ohio | 937,282 | 461,998 | 16.2 | 9,498,290 | 4,656,274 | 105.0 | 1,451,820 | 725,910 | 13.4 | 6,218,678 |
| Oklahoma | 946,041 | 497,135 | 32.1 | 3,367,100 | 1,746,498 | 136.6 | 1,301,247 | 683,208 | 75.7 | 3,747,112 |
| Oregon | 1,156,664 | 700,251 | 53.7 | 3,578,438 | 2,141,103 | 114.9 | 563,037 | 323,476 | 27.4 | 1,114,302 |
| Pennsylvania | 2,762,712 | 1,373,188 | 33.9 | 10,313,435 | 5,144,002 | 151.0 | 3,483,694 | 1,732,396 | 51.1 | 4,473,787 |
| Rhode Island | 275,020 | 137,510 | 2.8 | 1,320,196 | 660,098 | 16.5 | 10,890 | 4,134 | | 902,980 |
| South Carolina | 1,010,145 | 420,200 | 68.0 | 5,236,124 | 2,139,558 | 280.0 | 630,496 | 282,935 | 40.3 | 2,014,011 |
| South Dakota | 674,302 | 399,826 | 46.8 | 1,745,878 | 970,716 | 191.7 | 1,139,948 | 630,660 | 101.1 | 3,546,060 |
| Tennessee | 589,818 | 294,909 | 25.7 | 1,634,344 | 817,172 | 50.2 | 935,240 | 467,620 | 32.6 | 4,936,328 |
| Texas | 3,628,267 | 1,812,886 | 281.6 | 10,609,662 | 5,284,686 | 615.4 | 2,595,590 | 1,292,855 | 111.2 | 7,933,732 |
| Utah | 119,208 | 85,202 | 6.2 | 1,350,350 | 970,163 | 134.1 | 515,269 | 353,310 | 34.1 | 1,178,379 |
| Vermont | 510,922 | 246,154 | 12.3 | 1,306,739 | 586,863 | 37.1 | 253,120 | 92,429 | 3.5 | 323,344 |
| Virginia | 556,620 | 278,310 | 29.5 | 3,099,526 | 1,510,673 | 96.2 | 997,241 | 498,620 | 42.3 | 2,601,559 |
| Washington | 903,288 | 474,700 | 53.8 | 2,802,362 | 1,466,326 | 47.1 | 484,901 | 253,043 | 9.6 | 1,290,137 |
| West Virginia | 384,604 | 192,302 | 12.5 | 1,562,782 | 781,039 | 42.6 | 595,054 | 372,622 | 16.1 | 2,341,316 |
| Wisconsin | 3,066,543 | 1,477,210 | 88.6 | 6,388,302 | 3,043,365 | 181.5 | 2,255,891 | 1,080,900 | 70.9 | 1,531,986 |
| Wyoming | 573,928 | 353,946 | 67.0 | 2,345,335 | 1,413,229 | 259.2 | 552,020 | 336,700 | 46.1 | 448,232 |
| District of Columbia | | | | | | | | | | 1,227,500 |
| Hawaii | 236,496 | 117,895 | 4.4 | 616,749 | 301,733 | 12.8 | 371,350 | 182,080 | 5.4 | |
| Puerto Rico | | | | | | | | | | 625,000 |
| TOTALS | 47,508,778 | 24,902,214 | 2,132.3 | 204,412,881 | 101,897,085 | 7,027.9 | 62,555,254 | 31,384,854 | 2,278.4 | 120,172,937 |

# CURRENT STATUS OF UNITED STATES WORKS PROGRAM HIGHWAY PROJECTS

## (AS PROVIDED BY THE EMERGENCY RELIEF APPROPRIATION ACT OF 1935)

### AS OF AUGUST 31, 1937

| STATE | APPORTIONMENT | COMPLETED | | | UNDER CONSTRUCTION | | | APPROVED FOR CONSTRUCTION | | | BALANCE OF FUNDS AVAILABLE FOR NEW PROJECTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Estimated Total Cost | Works Program Funds | Miles | Estimated Total Cost | Works Program Funds | Miles | Estimated Total Cost | Works Program Funds | Miles | |
| Alabama | $ 4,151,115 | $ 3,639,922 | $ 3,602,858 | 130.1 | $ 408,640 | $ 408,640 | 8.1 | $ 80,572 | $ 80,572 | 6.5 | $ 59,045 |
| Arizona | 2,569,841 | 3,009,710 | 2,418,697 | 188.6 | 144,128 | 73,622 | 7.3 | | | | 77,522 |
| Arkansas | 3,352,061 | 2,951,502 | 2,932,664 | 324.5 | 380,793 | 379,276 | 35.8 | | | | 40,121 |
| California | 7,747,928 | 7,419,903 | 7,179,790 | 253.6 | 721,829 | 554,363 | 10.3 | | | | 13,775 |
| Colorado | 3,395,263 | 2,505,903 | 2,459,381 | 101.0 | 89,597 | 89,596 | 6.0 | 8,200 | 8,200 | | 838,086 |
| Connecticut | 1,418,709 | 783,035 | 732,184 | 9.5 | 597,540 | 579,820 | 12.9 | 124,130 | 64,435 | .2 | 42,270 |
| Delaware | 900,310 | 605,918 | 580,185 | 48.9 | 278,155 | 278,155 | 17.9 | | | | 41,970 |
| Florida | 2,597,144 | 2,511,247 | 2,448,539 | 94.7 | 106,968 | 106,968 | 4.3 | | | | 41,638 |
| Georgia | 4,988,967 | 1,094,740 | 1,076,584 | 73.9 | 1,671,783 | 1,671,783 | 94.4 | 1,297,474 | 1,297,474 | 51.2 | 943,126 |
| Idaho | 2,222,747 | 2,248,945 | 2,151,909 | 185.6 | 49,205 | 49,131 | .3 | | | | 21,707 |
| Illinois | 8,694,009 | 7,896,767 | 7,726,978 | 444.8 | 887,743 | 887,743 | 43.2 | | | | 79,288 |
| Indiana | 4,941,255 | 4,290,541 | 4,072,063 | 180.9 | 920,670 | 862,447 | 57.5 | | | | 6,745 |
| Iowa | 4,991,664 | 4,741,882 | 4,441,051 | 519.8 | 500,418 | 491,207 | 8.5 | 59,808 | 57,770 | .3 | 1,636 |
| Kansas | 4,994,975 | 4,311,232 | 4,270,824 | 347.3 | 672,665 | 630,493 | 28.9 | 35,840 | 35,840 | 13.9 | 57,818 |
| Kentucky | 3,726,271 | 3,227,153 | 3,099,896 | 344.4 | 548,005 | 548,005 | 13.6 | | | | 78,370 |
| Louisiana | 2,890,429 | 2,426,574 | 2,169,478 | 157.0 | 660,493 | 599,816 | 10.7 | 112,699 | 74,701 | 10.4 | 46,434 |
| Maine | 1,676,799 | 1,476,926 | 1,464,500 | 68.6 | 187,028 | 184,429 | 6.8 | 27,870 | 27,870 | .7 | |
| Maryland | 1,750,738 | 471,481 | 464,705 | 17.6 | 747,571 | 747,571 | 17.4 | 193,134 | 159,302 | 6.4 | 379,160 |
| Massachusetts | 3,262,885 | 391,467 | 391,467 | 4.0 | 2,609,120 | 2,218,350 | 14.4 | 1,149,906 | 581,543 | .8 | 71,525 |
| Michigan | 6,301,414 | 6,480,310 | 5,940,287 | 287.2 | 297,637 | 296,521 | 4.8 | 49,900 | 39,282 | .3 | 25,324 |
| Minnesota | 5,277,145 | 5,898,286 | 4,920,831 | 887.3 | 557,634 | 332,378 | 15.3 | 42,575 | 23,936 | .8 | |
| Mississippi | 3,457,552 | 2,659,690 | 2,655,872 | 184.3 | 698,700 | 697,660 | 50.4 | 40,000 | 40,000 | 1.5 | 64,020 |
| Missouri | 6,012,652 | 4,981,893 | 4,883,496 | 770.8 | 1,118,577 | 988,205 | 6.9 | 34,390 | 32,294 | | 108,657 |
| Montana | 3,676,416 | 3,432,741 | 3,421,094 | 192.8 | 278,930 | 237,591 | 9.9 | 8,462 | 8,462 | | 9,269 |
| Nebraska | 3,870,739 | 3,130,686 | 3,031,142 | 329.8 | 605,971 | 605,968 | 39.5 | 226,511 | 226,511 | 3.2 | 7,118 |
| Nevada | 2,243,074 | 2,291,081 | 2,209,009 | 110.0 | 33,646 | 33,646 | | | | | 419 |
| New Hampshire | 945,225 | 789,220 | 758,968 | 34.4 | 160,072 | 159,287 | 5.8 | | | | 26,970 |
| New Jersey | 3,129,805 | 1,060,687 | 1,057,687 | 16.8 | 2,038,819 | 2,025,664 | 18.6 | 6,110 | 6,110 | | 40,344 |
| New Mexico | 2,871,397 | 2,605,098 | 2,600,277 | 196.2 | 210,438 | 210,438 | 16.0 | 14,681 | 12,196 | | 48,486 |
| New York | 11,046,377 | 10,350,071 | 9,920,008 | 158.4 | 543,989 | 543,989 | 11.8 | 130,000 | 130,000 | .5 | 452,380 |
| North Carolina | 4,720,173 | 3,401,910 | 3,331,340 | 227.2 | 1,335,770 | 1,335,770 | 63.5 | 39,700 | 39,700 | .5 | 13,363 |
| North Dakota | 2,867,245 | 2,388,075 | 2,362,829 | 362.8 | 197,305 | 197,249 | 13.6 | 292,734 | 292,734 | 39.8 | 14,433 |
| Ohio | 7,670,815 | 5,560,739 | 5,479,661 | 216.2 | 2,007,417 | 1,973,367 | 76.3 | 188,130 | 182,130 | 4.2 | 35,657 |
| Oklahoma | 4,580,670 | 4,140,688 | 4,042,366 | 386.6 | 492,646 | 492,586 | 18.6 | 77,400 | 35,307 | 3.8 | 10,410 |
| Oregon | 3,038,642 | 2,763,204 | 2,656,321 | 158.6 | 513,539 | 369,706 | 6.0 | | | | 12,615 |
| Pennsylvania | 9,347,797 | 3,003,215 | 2,834,276 | 145.5 | 5,626,723 | 5,268,520 | 108.9 | 1,405,621 | 1,099,888 | 31.4 | 145,113 |
| Rhode Island | 989,208 | 1,109,360 | 986,896 | 18.8 | 2,240 | 2,240 | | | | | 72 |
| South Carolina | 2,702,012 | 2,179,123 | 2,059,166 | 220.1 | 650,935 | 587,605 | 29.5 | 21,242 | 21,242 | 1.5 | 33,998 |
| South Dakota | 2,976,454 | 2,339,531 | 2,336,310 | 426.4 | 614,617 | 614,617 | 78.2 | 9,972 | 9,972 | | 15,555 |
| Tennessee | 4,192,460 | 2,759,284 | 2,732,492 | 114.8 | 1,185,681 | 1,185,681 | 32.6 | 123,170 | 123,170 | 1.2 | 151,117 |
| Texas | 11,989,350 | 12,609,144 | 11,546,037 | 1,106.4 | 384,461 | 285,584 | 5.9 | 159,161 | 143,575 | 13.2 | 14,155 |
| Utah | 2,067,154 | 1,952,289 | 1,751,363 | 190.6 | 277,275 | 276,714 | 17.5 | 11,021 | 11,021 | .6 | 28,056 |
| Vermont | 924,306 | 1,016,181 | 883,048 | 21.9 | 49,422 | 36,400 | 1.3 | | | | 4,858 |
| Virginia | 3,652,667 | 3,337,365 | 3,267,100 | 1,001.9 | 180,843 | 180,843 | 24.1 | 58,618 | 58,506 | 3.9 | 146,218 |
| Washington | 3,026,161 | 3,314,896 | 2,913,200 | 163.4 | 85,272 | 85,272 | .9 | 25,465 | 20,845 | .7 | 6,844 |
| West Virginia | 2,231,412 | 1,158,692 | 1,149,044 | 52.4 | 1,178,085 | 1,042,188 | 42.7 | 47,560 | 40,180 | 5.4 | |
| Wisconsin | 4,823,884 | 5,205,645 | 4,690,599 | 337.7 | 133,855 | 124,000 | 6.1 | 5,025 | 4,900 | | 4,385 |
| Wyoming | 2,219,155 | 2,188,251 | 2,182,594 | 152.4 | 33,287 | 33,287 | | | | | 3,274 |
| District of Columbia | 949,496 | 950,000 | 949,496 | 8.8 | | | | | | | |
| Hawaii | 926,033 | 623,701 | 605,700 | 8.9 | 334,743 | 265,689 | 8.5 | | | | 54,644 |
| TOTALS | 195,000,000 | 161,685,904 | 153,842,262 | 11,984.2 | 34,010,880 | 31,850,080 | 1,111.5 | 6,107,081 | 4,989,668 | 202.9 | 4,317,990 |

# CURRENT STATUS OF UNITED STATES WORKS PROGRAM GRADE CROSSING PROJECTS

## (AS PROVIDED BY THE EMERGENCY RELIEF APPROPRIATION ACT OF 1935)

## AS OF AUGUST 31, 1937

| STATE | APPORTIONMENT | COMPLETED | | | | | UNDER CONSTRUCTION | | | | | APPROVED FOR CONSTRUCTION | | | | | BALANCE OF FUNDS AVAILABLE FOR NEW PROJECTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Estimated Total Cost | Works Program Funds | NUMBER | | | Estimated Total Cost | Works Program Funds | NUMBER | | | Estimated Total Cost | Works Program Funds | NUMBER | | | |
| | | | | Grade Crossings Eliminated by Separation or Relocation | Grade Crossing Structures Reconstructed | Grade Crossings Protected by Signals or Otherwise | | | Grade Crossings Eliminated by Separation or Relocation | Grade Crossing Structures Reconstructed | Grade Crossings Protected by Signals or Otherwise | | | Grade Crossings Eliminated by Separation or Relocation | Grade Crossing Structures Reconstructed | Grade Crossings Protected by Signals or Otherwise | |
| Alabama | $ 4,034,617 | $ 3,041,147 | $ 3,040,883 | 42 | 1 | 12 | $ 798,172 | $ 798,172 | 6 | | | $ 256,063 | $ 195,563 | 5 | | | $ 14,674 |
| Arizona | 1,256,099 | 1,113,686 | 1,079,056 | 13 | | | 199,472 | 162,370 | 2 | | 3 | | | | | | |
| Arkansas | 3,574,060 | 2,223,401 | 2,217,181 | 41 | 6 | 2 | 1,162,256 | 1,160,946 | 14 | | 5 | 160,159 | 159,889 | 1 | | 25 | 36,045 |
| California | 7,486,362 | 6,627,729 | 6,394,391 | 38 | 8 | | 1,082,369 | 1,079,589 | 9 | | | 10,000 | 10,000 | 5 | | | 2,382 |
| Colorado | 2,631,567 | 1,482,761 | 1,429,513 | 19 | 1 | | 881,478 | 850,333 | 9 | | | 377,010 | 339,301 | 3 | | 21 | 12,420 |
| Connecticut | 1,712,684 | 297,379 | 297,379 | 2 | 1 | 1 | 792,481 | 771,120 | 5 | | | 616,150 | 596,965 | 3 | | | 47,220 |
| Delaware | 418,239 | 130,000 | 130,000 | 1 | | | 277,993 | 277,993 | 2 | | | | | | | | 10,246 |
| Florida | 2,827,883 | 2,081,687 | 2,078,968 | 25 | 5 | 2 | 442,767 | 441,818 | 6 | | | 71,470 | 71,470 | | | 27 | 235,626 |
| Georgia | 4,895,949 | 148,437 | 146,945 | 4 | 3 | 1 | 1,251,771 | 1,251,771 | 26 | 6 | 4 | 1,026,000 | 1,026,000 | 16 | 3 | 47 | 2,471,233 |
| Idaho | 1,674,479 | 1,261,824 | 1,254,540 | 19 | 2 | 9 | 396,821 | 396,731 | 4 | | 8 | 4,921 | 4,921 | | | 4 | 18,287 |
| Illinois | 10,307,184 | 7,123,011 | 7,096,719 | 57 | 6 | | 2,998,945 | 2,998,945 | 16 | 2 | | 161,000 | 161,000 | | 2 | | 50,520 |
| Indiana | 5,111,096 | 3,494,867 | 3,342,522 | 31 | 12 | | 1,730,071 | 1,730,071 | 11 | | 163 | | | | | | 38,503 |
| Iowa | 5,600,679 | 3,651,048 | 3,561,663 | 82 | 9 | 7 | 1,967,638 | 1,964,911 | 25 | | | 80,407 | 68,690 | | | 1 | 5,415 |
| Kansas | 5,246,258 | 3,307,564 | 3,302,561 | 49 | | 5 | 1,964,175 | 1,891,929 | 9 | 1 | | 111,090 | 15,000 | 2 | | | 36,768 |
| Kentucky | 3,672,387 | 1,084,522 | 1,073,847 | 14 | 3 | | 2,234,921 | 1,945,189 | 10 | 7 | | 614,656 | 601,064 | 4 | 2 | | 52,287 |
| Louisiana | 3,213,467 | 1,148,910 | 1,148,910 | 12 | 1 | | 1,207,679 | 1,207,661 | 12 | 1 | | 862,485 | 660,466 | 7 | 1 | | 196,429 |
| Maine | 1,426,861 | 1,010,930 | 1,008,683 | 18 | | 2 | 366,278 | 366,278 | 1 | 2 | | 71,740 | 24,068 | 1 | | 2 | 27,833 |
| Maryland | 2,061,751 | 418,680 | 418,680 | 3 | 3 | 16 | 804,729 | 804,729 | 4 | 1 | 3 | 617,561 | 545,093 | 5 | 1 | 7 | 293,249 |
| Massachusetts | 4,210,833 | 1,533,336 | 1,533,251 | 13 | 3 | | 2,211,531 | 2,211,531 | 13 | 1 | | 249,991 | 249,991 | 1 | | | 216,060 |
| Michigan | 6,765,197 | 5,981,247 | 5,787,280 | 43 | 6 | | 969,077 | 898,608 | 1 | 2 | | 43,500 | 43,500 | | 1 | | 35,809 |
| Minnesota | 5,395,441 | 4,146,084 | 4,027,069 | 75 | 11 | 39 | 1,365,677 | 1,354,524 | 10 | 2 | 11 | | | | | | 13,849 |
| Mississippi | 3,241,475 | 1,592,932 | 1,592,768 | 39 | 4 | 2 | 1,123,568 | 1,123,568 | 16 | 3 | 5 | 40,100 | 40,100 | | | 14 | 485,039 |
| Missouri | 6,142,153 | 1,374,333 | 1,358,845 | 19 | | | 4,942,291 | 4,761,400 | 30 | 1 | 1 | 1,650 | 1,650 | | | 1 | 20,258 |
| Montana | 2,722,327 | 2,657,848 | 2,536,243 | 37 | 7 | | 245,576 | 185,931 | 1 | 1 | | | | | | | 153 |
| Nebraska | 3,556,441 | 2,317,725 | 2,285,558 | 70 | 3 | 17 | 1,062,479 | 1,062,479 | 12 | | 2 | 219,670 | 194,632 | 5 | | 5 | 13,772 |
| Nevada | 887,260 | 885,820 | 859,960 | 8 | 3 | | 13,308 | 13,308 | | | | 3,630 | 3,630 | | | 5 | 10,362 |
| New Hampshire | 822,484 | 476,747 | 476,747 | 5 | 4 | | 317,463 | 317,396 | 4 | | 2 | 52,468 | 28,341 | 1 | | 5 | |
| New Jersey | 3,983,826 | 1,017,054 | 1,017,054 | 9 | 2 | 1 | 2,646,639 | 2,635,594 | 13 | 7 | | 291,410 | 291,410 | 2 | 1 | | 39,768 |
| New Mexico | 1,725,286 | 1,678,000 | 1,672,314 | 18 | 1 | | 25,879 | 25,879 | | | | 56,505 | 11,202 | 1 | | | 15,891 |
| New York | 13,577,189 | 8,315,865 | 8,069,841 | 25 | 32 | | 5,264,660 | 5,236,160 | 20 | 17 | | 94,000 | 94,000 | | | | 177,188 |
| North Carolina | 4,823,958 | 2,885,299 | 2,884,724 | 39 | 17 | | 1,311,593 | 1,292,042 | 18 | 1 | 108 | 484,680 | 484,680 | 4 | | | 162,512 |
| North Dakota | 3,207,473 | 1,970,338 | 1,965,783 | 38 | 2 | | 1,241,606 | 1,241,606 | 13 | 3 | | | | | | | 84 |
| Ohio | 8,439,897 | 1,441,897 | 1,364,395 | 9 | 3 | 2 | 5,852,726 | 5,494,403 | 36 | 5 | 1 | 1,284,879 | 1,184,174 | 12 | | | 396,325 |
| Oklahoma | 5,004,711 | 3,180,739 | 3,173,220 | 51 | 7 | 3 | 1,597,721 | 1,502,721 | 13 | 3 | 3 | 348,820 | 310,720 | 1 | 2 | 35 | 18,050 |
| Oregon | 2,334,204 | 2,239,057 | 2,154,389 | 15 | 6 | 2 | 177,027 | 174,122 | 2 | | | | | | | | 5,693 |
| Pennsylvania | 11,483,613 | 3,872,046 | 3,512,325 | 46 | 14 | 9 | 8,053,908 | 7,534,712 | 36 | 9 | | 150,000 | 150,000 | 4 | | | 286,575 |
| Rhode Island | 699,691 | 653,760 | 652,694 | 4 | 2 | | 44,314 | 44,314 | | 1 | | | | | | | 2,683 |
| South Carolina | 3,059,956 | 1,309,793 | 1,290,802 | 26 | 8 | 4 | 1,183,239 | 1,154,008 | 18 | 6 | 22 | 213,307 | 213,307 | 1 | 1 | 22 | 401,839 |
| South Dakota | 3,249,086 | 1,729,572 | 1,728,885 | 36 | 5 | 39 | 1,287,909 | 1,287,909 | 27 | 1 | 14 | 281,170 | 222,212 | 19 | | | 10,080 |
| Tennessee | 3,903,979 | 865,784 | 856,101 | 16 | 3 | 22 | 2,533,590 | 2,533,590 | 29 | | 3 | 253,550 | 253,550 | 1 | 1 | 14 | 260,738 |
| Texas | 10,855,982 | 8,969,804 | 8,958,446 | 117 | 13 | 60 | 1,224,393 | 1,224,390 | 9 | 2 | 5 | 382,758 | 370,914 | | 1 | 84 | 302,232 |
| Utah | 1,230,763 | 657,159 | 655,754 | 9 | 1 | 1 | 563,864 | 563,864 | 8 | | | | | | | | 11,145 |
| Vermont | 729,857 | 561,433 | 534,633 | 7 | 6 | 17 | 1,204,133 | 187,274 | 3 | 1 | 3 | | | | | | 7,950 |
| Virginia | 3,774,287 | 2,349,255 | 2,239,385 | 39 | 15 | 13 | 1,096,564 | 1,089,939 | 9 | 4 | | 417,340 | 415,326 | 2 | 2 | 11 | 29,636 |
| Washington | 3,095,041 | 2,469,207 | 2,434,480 | 21 | 11 | 8 | 645,948 | 645,524 | 2 | 1 | 1 | 4,562 | 4,562 | | | 2 | 10,476 |
| West Virginia | 2,677,937 | 266,614 | 266,614 | 3 | | 4 | 2,308,846 | 2,306,878 | 20 | 4 | 1 | 27,947 | 27,947 | 3 | | 2 | 76,498 |
| Wisconsin | 5,022,683 | 3,601,206 | 3,565,228 | 33 | 5 | | 1,426,581 | 1,426,537 | 4 | 2 | | 68,667 | 29,367 | | | 19 | 1,550 |
| Wyoming | 1,360,841 | 886,875 | 886,767 | 10 | | | 467,369 | 467,368 | 4 | | | | | | | | 6,706 |
| Dist. of Columbia | 410,804 | 417,779 | 410,804 | 3 | | | | | | | | | | | | | |
| Hawaii | 453,703 | 293,667 | 292,776 | 3 | | | 226,162 | 158,370 | 2 | | | | | | | | 2,556 |
| TOTALS | 196,000,000 | 112,245,858 | 110,067,576 | 1356 | 255 | 300 | 73,195,657 | 70,256,505 | 544 | 97 | 368 | 10,011,316 | 9,104,705 | 109 | 18 | 353 | 6,571,214 |

# *PUBLICATIONS of the BUREAU OF PUBLIC ROADS*

Any of the following publications may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C. As his office is not connected with the Department and as the Department does not sell publications, please send no remittance to the United States Department of Agriculture.

## *ANNUAL REPORTS*

Report of the Chief of the Bureau of Public Roads, 1924. 5 cents.

Report of the Chief of the Bureau of Public Roads, 1927. 5 cents.

Report of the Chief of the Bureau of Public Roads, 1928. 5 cents.

Report of the Chief of the Bureau of Public Roads, 1929. 10 cents.

Report of the Chief of the Bureau of Public Roads, 1931. 10 cents.

Report of the Chief of the Bureau of Public Roads, 1933. 5 cents.

Report of the Chief of the Bureau of Public Roads, 1934. 10 cents.

Report of the Chief of the Bureau of Public Roads, 1935. 5 cents.

Report of the Chief of the Bureau of Public Roads, 1936. 10 cents.

## *DEPARTMENT BULLETINS*

No. 583D..Reports on Experimental Convict Road Camp, Fulton County, Ga. 25 cents.

No. 1279D..Rural Highway Mileage, Income, and Expenditures, 1921 and 1922. 15 cents.

No. 1486D..Highway Bridge Location. 15 cents.

## *TECHNICAL BULLETINS*

No. 55T. . .Highway Bridge Surveys. 20 cents.

No. 265T...Electrical Equipment on Movable Bridges. 35 cents.

## *MISCELLANEOUS PUBLICATIONS*

No. 76MP..The Results of Physical Tests of Road-Building Rock. 25 cents.

No. 191MP.Roadside Improvement. 10 cents.

No. 272MP.Construction of Private Driveways. 10 cents.

No. 279MP.Bibliography on Highway Lighting. 5 cents.

Federal Legislation and Rules and Regulations Relating to Highway Construction. 15 cents.

The Taxation of Motor Vehicles in 1932. 35 cents.

An Economic and Statistical Analysis of Highway-Construction Expenditures. 15 cents.

Highway Bond Calculations. 10 cents.

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Single copies of the following publications may be obtained from the Bureau of Public Roads upon request. They cannot be purchased from the Superintendent of Documents.

## *SEPARATE REPRINT FROM THE YEARBOOK*

No. 1036Y..Road Work on Farm Outlets Needs Skill and Right Equipment.

## *TRANSPORTATION SURVEY REPORTS*

Report of a Survey of Transportation on the State Highway System of Ohio (1927).

Report of a Survey of Transportation on the State Highways of Vermont (1927).

Report of a Survey of Transportation on the State Highways of New Hampshire (1927).

Report of a Plan of Highway Improvement in the Regional Area of Cleveland, Ohio (1928).

Report of a Survey of Transportation on the State Highways of Pennsylvania (1928).

Report of a Survey of Traffic on the Federal-Aid Highway Systems of Eleven Western States (1930).

## *UNIFORM VEHICLE CODE*

Act I.—Uniform Motor Vehicle Administration, Registration, Certificate of Title, and Antitheft Act.

Act II.—Uniform Motor Vehicle Operators' and Chauffeurs' License Act.

Act III.—Uniform Motor Vehicle Civil Liability Act.

Act IV.—Uniform Motor Vehicle Safety Responsibility Act.

Act V.—Uniform Act Regulating Traffic on Highways.

Model Traffic Ordinances.

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A complete list of the publications of the Bureau of Public Roads, classified according to subject and including the more important articles in PUBLIC ROADS, may be obtained upon request addressed to the U. S. Bureau of Public Roads, Willard Building, Washington, D. C.

# CURRENT STATUS OF UNITED STATES PUBLIC WORKS ROAD CONSTRUCTION

AS PROVIDED BY SECTION 204 OF THE NATIONAL INDUSTRIAL RECOVERY ACT (1934 FUNDS) AND BY THE ACT OF JUNE 18, 1934 (1935 FUNDS)

AS OF AUGUST 31, 1937

| STATE | APPORTIONMENTS | | COMPLETED | | | | UNDER CONSTRUCTION | | | | APPROVED FOR CONSTRUCTION | | | BALANCE OF FUNDS AVAILABLE FOR NEW PROJECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sec. 204 of the Act of June 16, 1933 (1934 Fund) | Act of June 18, 1934 (1935 Fund) | Total Cost | 1934 Public Works Funds | 1935 Public Works Funds | Mileage | Estimated Total Cost | 1934 Public Works Funds | 1935 Public Works Funds | Mileage | 1934 Public Works Funds | 1935 Public Works Funds | Mileage | 1934 Public Works Funds | 1935 Public Works Funds |
| Alabama | $ 8,370,133 | $ 4,259,842 | $ 15,768,209 | $ 8,305,736 | $ 3,852,233 | 772.7 | $ 72,922 | $ 55,922 | $ 17,000 | 3.9 | | $ 288,105 | 1.5 | $ 8,475 | $ 72,504 |
| Arizona | 5,211,960 | 2,641,935 | 9,036,003 | 5,205,763 | 2,616,771 | 537.0 | 19,573 | | 19,573 | | | | | 6,197 | 5,591 |
| Arkansas | 6,748,335 | 3,428,049 | 11,094,422 | 6,714,187 | 3,409,259 | 626.4 | 47,750 | 33,944 | 13,586 | 10.9 | | 3,200 | | 204 | 2,005 |
| California | 15,607,354 | 7,932,206 | 30,592,038 | 15,607,354 | 7,738,760 | 763.9 | 114,733 | | 109,877 | | | | | | 83,569 |
| Colorado | 6,874,530 | 3,486,006 | 11,269,838 | 6,874,530 | 3,465,039 | 633.2 | 11,000 | | 11,000 | | | | | | 9,967 |
| Connecticut | 2,865,740 | 1,454,868 | 4,595,978 | 2,817,886 | 1,347,956 | 74.1 | 153,800 | 47,854 | 95,119 | 1.5 | | | | | 11,793 |
| Delaware | 1,819,088 | 923,395 | 2,782,832 | 1,818,804 | 916,149 | 128.9 | 8,210 | 284 | 7,846 | | | | | | |
| Florida | 5,231,834 | 2,661,343 | 9,034,121 | 5,175,534 | 2,414,418 | 307.3 | 289,764 | 56,300 | 233,464 | 2.9 | | | | | 13,461 |
| Georgia | 10,091,165 | 5,113,491 | 13,873,270 | 9,412,325 | 3,589,643 | 794.7 | 905,006 | 237,969 | 667,037 | 41.0 | $ 212,443 | 645,290 | 15.3 | 228,448 | 211,522 |
| Idaho | 4,486,249 | 2,277,486 | 7,125,725 | 4,486,249 | 2,199,313 | 501.5 | 74,779 | | 49,236 | 1.9 | | 11,428 | | | 17,508 |
| Illinois | 17,570,770 | 8,921,401 | 26,829,947 | 17,466,134 | 8,103,371 | 745.7 | 866,859 | 74,400 | 764,459 | 1.3 | | 28,100 | 9.3 | 30,236 | 25,471 |
| Indiana | 10,037,843 | 5,088,963 | 15,749,737 | 10,017,034 | 4,861,544 | 485.1 | 52,340 | | 52,340 | | | 58,728 | | 20,809 | 116,352 |
| Iowa | 10,055,660 | 5,118,361 | 15,790,338 | 10,055,660 | 5,118,361 | 1,227.3 | | | | | | | | | |
| Kansas | 10,089,604 | 5,117,675 | 15,469,336 | 10,089,029 | 5,052,747 | 1,144.2 | 72,137 | | 43,698 | 1.3 | | | | 574 | 21,231 |
| Kentucky | 7,517,359 | 3,818,311 | 12,206,450 | 7,480,082 | 3,744,977 | 814.7 | 39,626 | | 39,626 | .8 | 11,306 | 17,973 | | 25,971 | 15,735 |
| Louisiana | 5,828,591 | 2,963,932 | 9,132,363 | 5,755,288 | 2,688,031 | 258.9 | 395,131 | | 235,959 | 18.4 | | | | 73,303 | 39,942 |
| Maine | 3,369,917 | 1,711,586 | 5,329,092 | 3,363,872 | 1,702,680 | 195.0 | | | | | | 8,644 | | 6,045 | 262 |
| Maryland | 3,564,527 | 1,810,058 | 5,730,480 | 3,471,009 | 1,113,025 | 153.7 | 264,571 | 28,053 | 232,168 | 1.8 | 35,923 | 277,700 | 6.0 | 29,542 | 187,165 |
| Massachusetts | 6,597,100 | 3,350,474 | 10,510,393 | 6,550,778 | 3,139,337 | 115.5 | | | | | | 91,944 | .1 | 46,322 | 119,193 |
| Michigan | 12,736,227 | 6,452,568 | 20,772,274 | 12,736,227 | 6,295,890 | 768.1 | 179,788 | | 136,788 | .4 | | | | | 19,890 |
| Minnesota | 10,656,569 | 5,425,551 | 16,344,292 | 10,567,633 | 4,917,972 | 1,647.4 | 439,238 | | 410,723 | 2.6 | 50,020 | | | 38,916 | 96,856 |
| Mississippi | 6,978,675 | 3,540,227 | 13,091,450 | 6,785,737 | 3,295,243 | 726.2 | 343,052 | 125,000 | 206,158 | 19.3 | 36,115 | 9,000 | 1.2 | 31,822 | 29,826 |
| Missouri | 12,180,306 | 6,173,740 | 18,317,246 | 12,119,584 | 5,136,421 | 1,446.4 | 984,283 | | 984,283 | 1.1 | | | | 60,722 | 53,036 |
| Montana | 7,439,748 | 3,769,734 | 11,764,611 | 7,425,285 | 3,655,874 | 1,058.4 | 131,534 | 6,905 | 57,239 | .2 | | | | 7,558 | 56,621 |
| Nebraska | 7,828,961 | 3,964,364 | 13,080,739 | 7,812,918 | 3,856,568 | 1,044.8 | 139,099 | 16,043 | 88,400 | 10.7 | | | | | 19,396 |
| Nevada | 4,545,917 | 2,302,356 | 7,073,517 | 4,545,917 | 2,266,964 | 758.8 | 21,979 | | 21,979 | | | | | | 13,413 |
| New Hampshire | 1,909,839 | 969,462 | 3,007,927 | 1,904,951 | 955,186 | 78.3 | | | | | | | | 4,589 | 18,276 |
| New Jersey | 6,346,039 | 3,220,879 | 9,223,863 | 6,165,750 | 2,455,730 | 88.4 | 1,197,893 | 99,977 | 663,430 | 8.6 | 79,589 | 23,874 | .5 | 723 | 77,814 |
| New Mexico | 5,792,935 | 2,941,700 | 8,912,013 | 5,748,150 | 2,922,863 | 750.0 | 55,585 | 29,694 | 10,800 | 1.2 | | 2,695 | | 15,091 | 5,342 |
| New York | 22,330,101 | 11,327,921 | 40,581,056 | 22,228,884 | 11,014,795 | 825.1 | 192,932 | 6,831 | 59,900 | .1 | 6,600 | 124,900 | | 87,786 | 128,326 |
| North Carolina | 9,522,293 | 4,840,941 | 15,320,720 | 9,364,174 | 4,721,698 | 1,357.6 | 238,501 | 143,020 | 93,171 | 40.9 | 5,960 | 8,200 | | 9,139 | 17,872 |
| North Dakota | 5,804,448 | 2,938,967 | 8,927,781 | 5,736,109 | 2,406,584 | 2,151.7 | 112,386 | | 112,386 | 14.9 | | 199,691 | 3.9 | 68,339 | 220,305 |
| Ohio | 15,484,592 | 7,865,012 | 24,843,973 | 15,426,422 | 7,548,533 | 795.4 | 362,122 | 50,000 | 245,975 | 4.9 | | | | 8,170 | 70,504 |
| Oklahoma | 9,216,798 | 4,685,180 | 14,782,680 | 9,214,165 | 4,449,353 | 806.6 | 232,864 | | 232,663 | .4 | | | | 2,633 | 3,164 |
| Oregon | 6,106,896 | 3,097,814 | 10,077,336 | 6,102,835 | 2,963,472 | 469.5 | 46,467 | | 46,467 | | | | | 4,062 | 87,875 |
| Pennsylvania | 18,891,004 | 9,590,788 | 29,418,947 | 18,589,519 | 9,130,548 | 1,057.9 | 743,047 | 256,582 | 421,025 | 13.5 | 12,000 | | 1.0 | 32,903 | 39,215 |
| Rhode Island | 1,998,708 | 1,014,572 | 3,150,270 | 1,998,708 | 1,012,094 | 89.1 | 2,478 | | 2,478 | | | | | | |
| South Carolina | 5,459,165 | 2,770,954 | 8,221,105 | 5,368,486 | 2,519,597 | 625.8 | 277,234 | 217 | 242,149 | 10.6 | 40,000 | | .5 | 50,462 | 9,208 |
| South Dakota | 6,011,479 | 3,047,643 | 9,487,391 | 5,964,617 | 2,943,477 | 1,614.1 | 101,151 | 21,920 | 72,631 | 8.2 | 4,870 | 260 | 6.2 | 20,072 | 31,275 |
| Tennessee | 8,492,619 | 4,302,991 | 13,915,252 | 8,492,551 | 4,302,972 | 504.3 | | | | | | | | 68 | 19 |
| Texas | 24,241,024 | 12,291,253 | 38,055,068 | 24,200,959 | 11,938,719 | 2,782.4 | 338,328 | 2,797 | 335,531 | .4 | | 2,050 | | 40,268 | 14,953 |
| Utah | 4,194,708 | 2,132,691 | 7,459,642 | 4,194,708 | 2,132,691 | 590.9 | | | | | | | | | |
| Vermont | 1,867,573 | 948,007 | 3,180,278 | 1,867,573 | 948,007 | 141.0 | | | | | | | | | |
| Virginia | 7,416,757 | 3,765,387 | 11,591,319 | 7,326,822 | 3,381,572 | 629.1 | 232,166 | 26,448 | 200,086 | 20.7 | 38,186 | 171,333 | 22.8 | 25,301 | 12,396 |
| Washington | 6,115,867 | 3,106,412 | 9,407,780 | 6,112,042 | 3,020,316 | 303.0 | 46,596 | | 46,596 | | | | | 3,825 | 39,500 |
| West Virginia | 4,474,234 | 2,280,335 | 6,457,136 | 4,308,274 | 1,804,365 | 212.9 | 378,997 | 54,892 | 301,059 | 9.1 | | 168,139 | 1.7 | 111,068 | 6,772 |
| Wisconsin | 9,724,881 | 4,941,837 | 15,435,518 | 9,724,881 | 4,860,251 | 619.6 | 40,860 | | 40,860 | | | 16,475 | | | 24,251 |
| Wyoming | 4,501,327 | 2,287,712 | 6,907,387 | 4,476,017 | 2,212,298 | 1,040.2 | 57,140 | 24,635 | 32,505 | 12.0 | | 23,700 | .9 | 675 | 19,208 |
| District of Columbia | 1,918,469 | 973,842 | 2,892,447 | 1,918,469 | 973,842 | 22.3 | | | | | | | | | |
| Hawaii | 1,871,062 | 949,778 | 3,142,645 | 1,857,812 | 725,649 | 54.8 | 175,648 | | 172,480 | 1.1 | 13,250 | 26,799 | | | 24,850 |
| TOTALS | 394,000,000 | 200,000,000 | 636,764,235 | 390,953,433 | 187,873,158 | 35,339.9 | 10,459,526 | 1,399,687 | 7,529,150 | 266.6 | 546,262 | 2,208,228 | 70.9 | 1,100,618 | 2,089,464 |